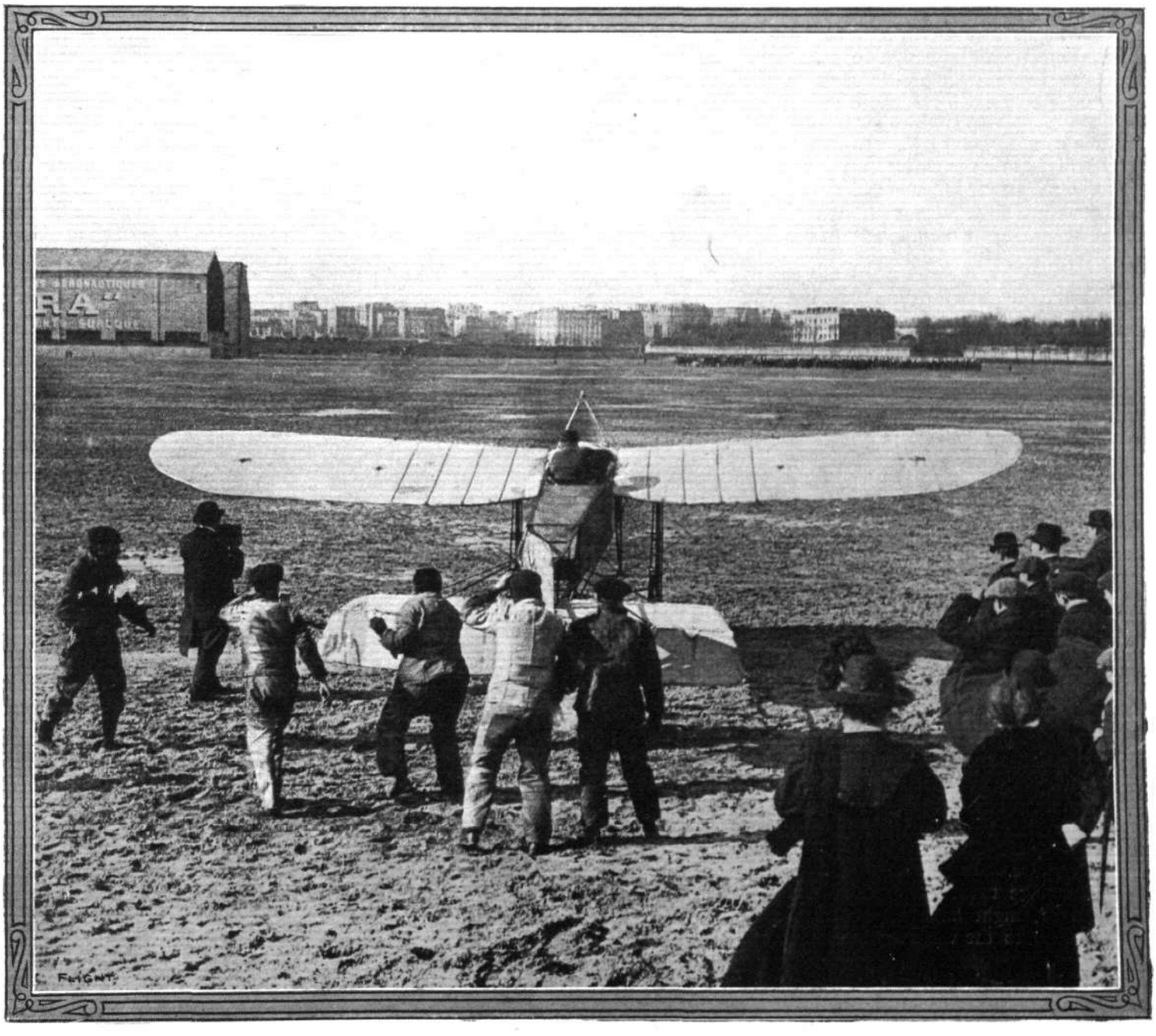
FLIGHT

First Aero Weekly in the World.

A Journal devoted to the Interests, Practice, and Progress of Aerial Locomotion and Transport.

OFFICIAL ORGAN OF THE ROYAL AERO CLUB OF THE UNITED KINGDOM.

No. 168. (No. 11, Vol. IV.)] MARCH 16, 1912. [Registered at the G.P.O. as a Newspaper.] [Weekly. Price 1d. Post Free, 1½d.



THE RECORD NON-STOP HENDON TO PARIS FLIGHT OF MR. SALMET.—Mr. Salmet, on his Blériot monoplane, at the moment of being released at Issy grounds, for the return journey to London, after his remarkable flight from Hendon in a little over three hours.

EDITORIAL COMMENT.

The Government and the Flying Corps.

When Col. Seely made his statement to the House of Commons apropos the policy of the Government in relation to aerial defence, we welcomed his announcement on the broad lines that it marked a distinct alteration in the official attitude, and gave promise that at last it had been realised how immensely important it is that no effort within reason should be spared to bring this country into line with the rest of the Great Powers. In welcoming the Government scheme as we did, we naturally did so in the full belief that it does not mark finality in any sense—if we had thought otherwise our comments would have been far different to what they actually were—and neither did we intend to have the inference drawn that we held the opinion that the scheme was above criticism in detail. As a matter of fact, now that time enough has elapsed since the Under-Secretary's statement was made in the House to enable it to be examined calmly and logically, it seems to fall short in one or two essential points upon which we should like further enlightenment. For example, precisely how many aeroplanes does the Government contemplate acquiring during the coming financial year? The number foreshadowed as likely to be purchased under the Estimates is 131, but there seems to be some doubt as to whether they can be delivered during the year. If there be such doubt, why is it? Is it because the plans made by foreign Governments previous to the British official mind having found its bearings have so filled the aeroplane shops of the Continent that they cannot promise deliveries? And if that be the reason, is it not all the more essential that some immediate and ample measures should be taken to create a home industry worthy of the country? Col. Seely was not encouraging in his remarks regarding British machines, and, unfortunately, we are compelled to agree with him to the extent of admitting that we have far too few firms in the business who are able to construct machines which would be likely to pass the War Office tests. But there are such firms, and we doubt not that under promise of adequate Government support these firms would enlarge their facilities to an extent which would enable them to cope with all the business that is likely to come their way for some time. We have always endeavoured to make the point that it is no fault of the industry itself if—forgive us the seeming paradox—there is no industry. We are almost tired of drawing attention to the different circumstances under which the French industry has developed with the far-sighted support of the Government as compared with the neglect and starvation of our own. Now what we have prophesied all along has come to pass, and in the day that the State has need of a healthy manufacturing industry—fortunately for us the need is not vital as it might well have been—there exists no industry worth speaking of to fill the want. Thus we are forced abroad for the major part of what we require. It is a deplorable reflection, and all the more since the position is so totally at variance with what it might have been had the Government paid attention to the views of those who are best qualified to judge.

We have asked why it is unlikely that the projected number of aeroplanes will be obtained for the service of the new Flying Corps, when it is constituted. One reason, as we have pointed out, is probably that because constructors are so full up with foreign orders that they cannot give consideration to ours. If that is so, there can be only one explanation of the position, and that is the impossibility of obtaining engines in sufficient numbers. With all respect to the constructor of aircraft, the building of the machine itself is comparatively a minor matter. But it is one thing to build the 'plane itself, and quite another to equip it with a satisfactory power plant. This brings us to what we conceive to be a distinctly weak point in the Government programme as officially outlined. We hear much about aeroplanes, but not a word about engines. True, the one of necessity implies the other, and we suppose it may be taken for granted that when the Government speaks of building up an aeroplane industry in this country all the subsidiary issues are included, although we hear of a type of foreign engine being specified in cases where orders have been forthcoming to British firms. But on this point we should like something more specific. Here in England we have several firms which are doing, under severe handicap, excellently good work in the development of aerial motors, and we honestly believe that a motor as good as any in the world can be made in our own British machine shops. Unless, however, those individuals and firms are assured of adequate support they must inevitably be driven into more profitable lines of business, and our last case will be worst than the first. With that patriotic prescience which seems to be characteristic of other administrations than our own, foreign Governments are stipulating that, so far as is possible, all their aerial motors shall be manufactured in home shops, thus rendering the nation absolutely independent of outside sources of supply for anything that may be needed. We, on the contrary, even at the eleventh hour of awakening, appear to assume that for the time being we must of necessity rely upon others, and that in the time to come, if only the proverbial luck of the British Army sticks to us, some sort of an industry will develop along some haphazard line or another.

We undoubtedly are producing good engines, and surely, between the Green, the Wolseley, the N.E.C., the E.N.V., and others, we can engine all the machines provided for in the Estimates. But why should these firms go on doing a sort of hand-to-mouth business indefinitely, sinking money in experiment and brains in effort to improve their types? The official markets of the outside world are practically closed to them for the reason we have given—and, we maintain, the reason is a good and sound one, and one that ought to be applied in England, ruthlessly and at once. The only point, it seems to us, upon which the Government requires to be satisfied is that of whether it is possible to obtain from our own manufacturers a motor which is equal in construction and performance to those produced in other countries, and, having been satisfied of that, the fiat should go forth: "None but British motors in British aeroplanes." Then we could go ahead, and there is, to our mind, not the very least little doubt but that the history of the motor trade would repeat itself and the British production would be before very long absolutely the best in the world. We have the brains, we have the engineering knowledge, both theoretical and practical, and we have the needful initiative—all that is necessary is proper encouragement for the development of our latent resources. Will it be forthcoming?

FLIGHT PIONEERS.

MR. HENRI SALMET,

The chief instructor of the Blériot School at Hendon, who made the record non-stop flight from Hendon to Paris on March 7th on a 50-h.p. Gnome-engined Blériot monoplane, his time being 3 hrs. 16 mins.

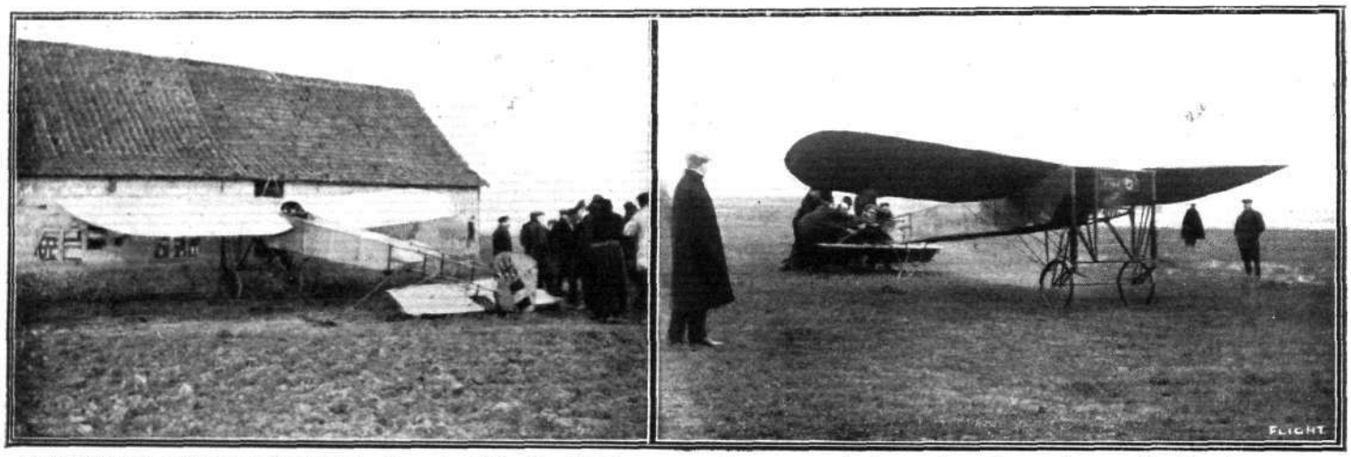
MY PARIS FLIGHT.

By HENRI SALMET, Chief Instructor of the Blériot School, Hendon.

FOR some time past I have wanted to fly to Paris and back in one day, and also, as I should like to see M. Blériot in Paris about business matters. I think, it being fine, on Thursday the 7th, I will go. The night before I paint on the wings of my Blériot some varnish that keep the fabric tight and make it waterproof, and later I telegraph to the coastguard at Eastbourne to telephone me in the morning if the weather is good. Next morning early the message arrive. The coastguard say the Channel is clear of fog, so I get ready. The *fuselage* of my Blériot had already been covered in with fabric and waterproofed so as to make a float and keep me up if my engine fail and I go in the water. Round me I put an inner tyre from one of the school machines which I blow up. I run my engine and it go very well, so I wave my hand and I am away.

When I left here it was exactly 7.45, with little wind behind me. The wind increased, and after about a quarter of an hour the wind was much more stronger, and my speed was about half as much again. At Eastbourne I was 1,200 metres high and about 2 miles over the sea, but the wind was too gusty. I came back, and I took 3,000 ft. more high, and that took me 13 mins. After that, I started again on my way to Paris, and I flew for 1 hr. 40 mins. without seeing anything other than the clouds. The sight at that height was most marvellous—I think absolutely the best something I have seen in my life. At that height the clouds were more like big snowy mountains, and flying through them was the most curious experience that could happen to anyone. A glance behind showed my wake in a swirl of fog disturbed by the propeller and the passage of the machine. So cold was it in the clouds, that I had I should have been thrown out several times. Issy was absolutely deserted because I arrived before my telegram. On landing I took from my machine the little can of paraffin I always carry, and washed over the engine—my good engine, which had brought me all the way from London without any trouble. All the more pleasure because I myself look after the engine, no one else touch it. Then I go to find someone, and I find a guardian of the aerodrome with a mechanic from the Astra Company, and I asked him "Where are the Blériot hangars?" and he say "Opposite there." As I turned to go to the sheds he say to me "Can you tell me any news of the English aviator who should fly from London to Paris?" and I say "The English aviator is me." Then we shake hands. Then he say "If you are the English aviator you speak French very well indeed. What is your name?" and I said "Henri Salmet of the Blériot School in England." Then I go to the Blériot sheds and get the mechanics to fetch my machine and put it safe in the hangar. I ask for M. Blériot's telephone number to ring him up and tell him I arrived. I telephone and he speak himself, and he say "Why do you not send a telegram?" At that moment the telegraph boy must have come into his office, for he say "the telegram has just arrived now." I say "When can I see you M. Blériot?" and he say "I see you about three or four" but I reply "I shall be far off by then." He say "Why?" I say "Because I want to get back to London to-day." Then he came down to Issy in a car with M. Leblanc, and some reporters.

M. Blériot seem very please. He say "*Bon jour, Salmet. Toutes mes felicitations! Par où avez vous passé.*" I say that I had



SALMET'S PARIS FLIGHT.—On the left his Blériot monoplane pegged down for the night at Berck Plage, near Dieppe. Note the cut-away wings, the covered-in fuselage forming a float, and the *Entente Cordiale* emblem on the rudder. On the right is seen the moment of his start from Berck Plage the following morning.

constantly to increase my high so that I could get above them. This brought me to a height of between 6,000 and 7,000 ft., and as I could not see the sea, steering had to be entirely done by compass. This was hard to do, for the wind, although fairly steady, set the monoplane rolling slowly, and the compass needle kept swinging continually about ten degrees each side of the true line. This had to be accounted for. From points that I had recognised over English soil, I calculated that my speed was something over 130 kiloms. an hour, and from the time I got my last glimpse of the earth, I flew for 1 hr. 40 mins., and then from my speed calculated just about where I ought to find myself. Here I thought I ought to descend, as I wanted to make sure that my compass was guiding me correctly, and that I was on my right way.

For a long time I see nothing but the wings of my machine. I came down to 200 metres in order to distinguish points that I wanted to find. Then I flew round in big circles for 17 minutes, at last recognising a castle that I had marked on my map. Picking up the adjacent railway line, I reached Gisors. Here it was clearer, and I gradually elevated to 2,000 metres. Although it was possible to distinguish land marks, I did not look down once as I was so occupied in fighting the gusty wind that I did not trouble to do so, knowing full well my compass was steering me correctly. I saw the Eiffel Tower after a long struggle, and the sight gave me very big pleasure because it is the first cross-country flight I have make. I see Issy from 1,500 metres, and commenced my *vol plané*.

To battle against the *remous* caused by the big houses, I have to descend very steep to keep up my speed. Gusts rapidly struck me from below, and had I not gripped the *cabane* with all my might come by the way I had chosen, and that I had tell him some time before. He is very happy that I do cross the channel at the wide part, from Eastbourne to Dieppe—thing that had not been done since aviation existed. In his great joy he grasp my both hands, and squeeze so hard that he hurt much. And M. Leblanc also. Then we have lunch at the Café Syndicat des Aviateurs. They say to me, there is too much wind, and you cannot return. But I did not pay attention to that, as no matter what the struggle I had big confidence in my Blériot, my Gnome, and my wonderful Levasseur propeller, which give so much pull and runs so smoothly. It is the best I have try. With my three faithful friends, my machine, my motor, my propeller, the wind have no fear for me. So at 2.15 with the *anemometre* at 34 kilometres. to the hour, I start once more. The start is not alone, because the ground is used by the soldiers, but I go to ask at the Commandant to let me start. He say "Yes, with pleasure," and he took his soldiers in a good place to give me plenty of room, and I go. I start straight on my line, but the ground is not much large and when I am over the houses I am very low, and the wind put me sometime in very bad situation. I am very long to take my high, because sometime I am 200 metres up, and then I come down again with the wind.

After I have crossed the Seine I have less *remous*, and I go more high. Since this time the wind is much more regular, but so strong that I take nearly four hours to make 220 kiloms. I am very cross against the weather, because I am obliged to land at Berck Plage with my petrol tank nearly empty.

As soon after my landing I start to find petrol. That take me too

long time, and after that it is too late to start. I had wanted very much to sleep on English ground that night. A friend help me find petrol and oil, and after filling the tanks, I go to take something to eat with him. As he knew I wanted to start early next morning, he locked me in my bedroom that night, so that I should not go without him seeing me. At five o'clock he come in my room and give me a good cup coffee. I took it, and soon after I go with him to where the machine is tied up. I give a little exhibition fly, and land on the shore. Then before they let me go I have to sign many post-cards, and many people take photographs of the machine.

Starting again just before ten, the wind was blowing about 32 kiloms., and was a little foggy. I fly for two miles, and my engine start missing. My magneto is wrong. I put it right, and I start again at 10.12. Then I go across the Channel from Cap Grisnez to Folkestone very fast indeed. I am across the other side in fifteen minutes, and there the wind come more badly. Having no map, and as the compass rock very badly, I keep over the main road. The wind and rain beat very hard in my face. I don't like to land because I like to put my machine in my shed at Hendon before landing anywhere. But the wind and rain coming always more strong, I think it more wise to land than to continue. It take me a quarter of an hour to go four miles. Then, seeing a good landing ground on my left, I come down, and find I am at Chatham. If I am very cross against the weather I meet there the best people I have ever met. All people is ready to help me for anything. They all want to give me something to eat. I go with Mr. Sills, who has a room where I can be quiet, for I am very tired after the struggle. The schoolmaster there makes a meeting in my honour, and I go there in the evening, and they give me a big tri-colour bouquet, and after much shouting I have to sign many postcards.

The next morning I start at 6.15 in a very bad wind towards London. My *cloche* is always moving; but all is well until I fly into some fog. I remember the Regent's Park happening, and I think it better to descend than to continue and land in some place where the Aero Club would not like it. Near Maidstone I have to land in a *champ laboré*, and I break a piece off my propeller. My good friends from Hendon soon bring me another one, and we put it on. The weather is not favourable to start, but I am so hurry to come to Hendon that I look with a bad eye at those who say the weather is too bad. I go on again; but soon after my motor stopped, and I have to descend in a football field near Beckton gas-works. I land very deep from 800 metres, because ground is small. I see I am going to hit a goal-post, so I pull back my *cloche* to clear it. My speed slackens as I rise, and a gust comes and blows me right over. I am sad, for it is the first smash I have ever had since I started to learn to fly. To me the smash itself was nothing, but to think that it should happen after those days of struggling grieved me much. However, the smash was done properly; and so disgusted was I at not being able to get to Hendon, that I walked away without looking to see my machine. There I found friends who were very amiable to me, principally William Marsh, whom I shall not forget. The smash did not hurt me, for here I am, with only a little cut on my knuckle. Then—*Mais c'est tout! Voilà la fin de mon pauvre et triste voyage!*

⊛ ⊛ ⊛ ⊛

THE AVIATION GRANT.

IN the debate on the Army Estimates in the House of Commons last Wednesday week, Mr. Lee, M.P., welcomed the substantial, if tardy, provision of the War Office in regard to aviation. If war had broken out last summer, he said, we should have been the only nation without eyes in the modern sense. So far as the scheme was concerned, he recognized its broad national framework. In this matter there should be a national flying corps in which both the Army and Navy should co-operate. Compared with the provision made by Germany or France, our Vote looked somewhat unsubstantial. On behalf of the Parliamentary Aerial Defence Committee, however, he heartily approved the Government's action for the immediate purchase of a considerable number of aeroplanes of any make—British or foreign—that happened to be efficient. They needed to give to the Army the necessary eyes at the earliest possible moment, and particularly to our Expeditionary Force. He thought that the Government had proceeded on sound lines, and he expressed the hope that no efforts would be spared to complete the equipment soon. We needed a sufficient equipment for home defence also, and he hoped that this point would not be forgotten.

It was also satisfactory to find that the Government were doing something to encourage private enterprise. These pioneers, in risking life and money, deserved well of their country. He trusted also that the Government would not limit the number of officers who might be permitted to get the Aero Club certificate at any of the flying schools. At this stage the War Office could not have too many flying men. When they considered the needs of home defence and of the Army abroad it was necessary to have every man they could obtain.

He hoped also that adequate remuneration would be given to the officers and men who took a share in this work. These men deserved as well of their country as, say, those of the submarine service in the Navy, and at least they ought to be as well treated. Finally, he hoped that the independence of this new flying corps would be secured, that it would not be made the appanage of any vested interest at the War Office, that it would have some representative there who was a whole-time chief and that the work would be taken out of the hands of some hard-worked official. The commandant of the new school should be an officer of sufficiently high rank and prestige as to be able to command the attention of the military public. What was wanted was not only prestige, daring, enterprise, and initiative, but that there should be no tethering of the aeroplane or flying corps to the strings of the War Office. He congratulated Col. Seely on his personal efforts as chairman of the committee which had produced this scheme. But he conjured him not to rest on his oars in respect of the progress of this important movement, assuring him that if he required any assistance from the Opposition to help forward a scheme that was essential for the Army service the right hon. gentleman would receive it in no small measure.

Replying to the debate Col. Seely mentioned that his department had been asked why they spent £90,000 on buying a flying ground. He would point out that an extension of land for War Office purposes in the neighbourhood of Salisbury Plain was badly wanted. It would be useful for training as well as for aviation.

On the following day Col. Seely, in reply to a question by Mr. Joynson-Hicks said negotiations were in progress for 36 new aeroplanes, 18 of which were British. The flying corps was open to all branches of the Army, including the Territorial Force, and it was hoped and anticipated that a number of members of that force would join it. It was proposed to train non-commissioned officers and men in flying as well as officers. The distribution of the orders for aeroplanes, as between British and French makers, had been based on the advice of the members of the Technical sub-committee, who had dealt with the matter. They were guided entirely by considerations of efficiency and safety. The French were far ahead of the British, or any other nation in this matter, and therefore their machines were, on balance, the safest of all. There were some British machines which were safe enough, but altogether the French built the safest machines.

In the adjourned debate in the Army Estimates on Tuesday last, Mr. Amery doubted whether the sum of £320,000 in the Estimates for aviation would cover the cost. He maintained that the Flying Corps should be under the control of the General Staff.

Col. Seely in replying said that it was absolutely vital for the Flying Service that there should be co-ordination and co-operation between the Navy and the Army, but he could not say at the moment exactly how that would be brought about. Mr. Amery had urged that the military wing should be under the Department of the General Staff. That suggestion would be very carefully considered, and he was disposed to think that the arguments of the hon. gentleman were so sound that it would have to be adopted.

⊛ ⊛

THE NAVY ESTIMATES.

VERY cold comfort is afforded to those who, in the light of the Army Estimates and Col. Seely's remarks thereon, have been led to anticipate that there would be a substantial allotment in the Naval Estimates for Aviation, by the following paragraph, which is the only reference to the subject either in the Estimates themselves or in Mr. Winston Churchill's explanatory memorandum: "The development of aviation for naval purposes has been the subject of special attention, and all possible measures have been taken to procure an adequate and immediate supply of trained officers and mechanics." We sincerely trust some light may be thrown on the subject when the Estimates are introduced into the House of Commons by Mr. Churchill.

AEROPLANE UNDERCARRIAGES.

By G. DE HAVILLAND.

(Concluded from last week.)

Breguet Biplane.—The Breguet undercarriage is a distinct departure from the ordinary type. In this machine the designer has successfully provided a real shock-absorbing device in place of the usual rubbers or springs. The rolling wheels are only 15 in. diameter, with 3½ in. tyres, and therefore well adapted to withstand side strains, at the same time they are comparatively light. No skid is fitted to the rear part of the machine, but the rudder is designed to perform this function should it come in contact with the ground. The weight is normally taken by the two rolling wheels, which are placed under the centre of gravity, and the propeller thrust is sufficient to pull the machine on to the single front wheel, which is steerable, and is coupled up to the hand wheel that operates the rear rudder. By this device the machine can easily be manœuvred on the ground. This undercarriage has a very short wheel base, and, as might be expected, this does not make for easy rolling on uneven ground. Reference will be made to the Breguet shock absorber later on.

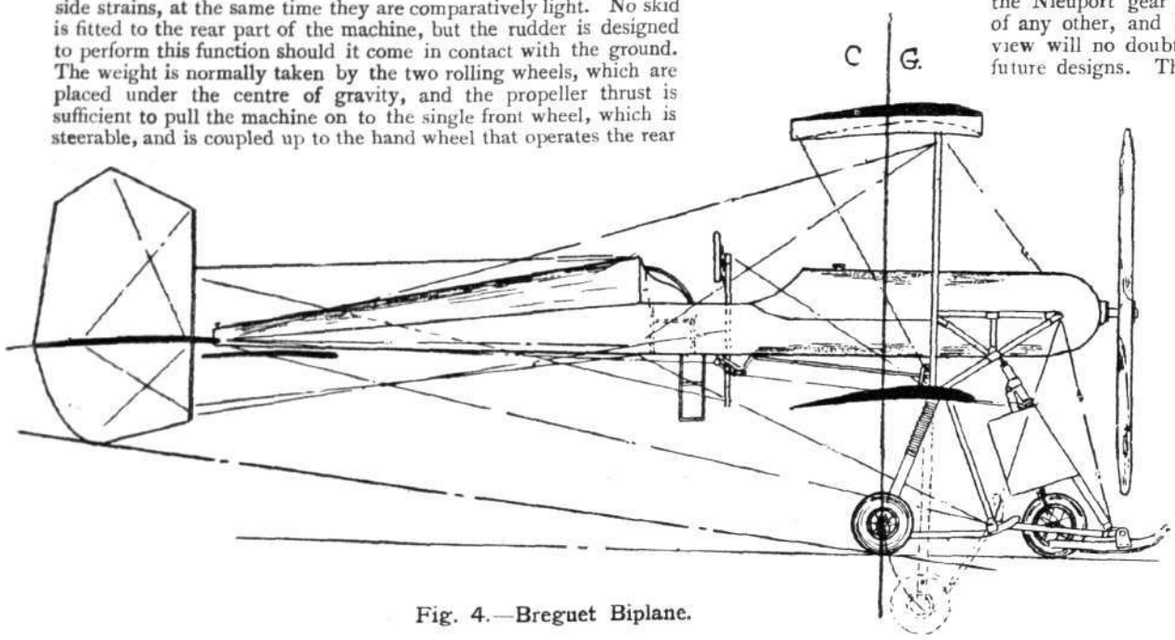


Fig. 4.—Breguet Biplane.

Nieuport Monoplane.—As the keynote of this machine is high aerodynamic efficiency, the design of the undercarriage has naturally been governed by the same principle, therefore head resistance has been reduced to a minimum. This is accomplished by the use of oval steel struts rigidly fixed to a centre steel tube skid, while the wheels are mounted at the end of a transverse laminated spring, which is attached to the skid in a position well forward of the centre of gravity. The result is a very rigid construction, while tie wires are almost entirely dispensed with, and the various parts likely to be damaged can easily be replaced. The wheels are fairly small in diameter, and have a comparatively narrow track, and this sometimes causes the machine to cant over laterally until the wing tip comes into contact with the ground. The ends of the wings, however, are constructed to withstand these strains, and therefore, materially assist the duty of the undercarriage, without adding extra head resistance or weight. The after end of the central skid takes the place of the more usual tail skid, but carries a large proportion of the total weight. A short base of support is generally to be discouraged, as it does not make for good fore and aft stability on uneven ground, but in this case some advantage is gained by the breaking effect given by the heavily loaded skid when pulling up after landing. When starting away, the propeller thrust is sufficient to take most of the weight off the skid, so that the speed is not seriously damped. As regards simplicity and cleanness of design, the Nieuport gear is probably ahead of any other, and from this point of view will no doubt have influence on future designs. The use of the wings themselves as lateral skids may also lead to development in further simplifying the main undercarriage.

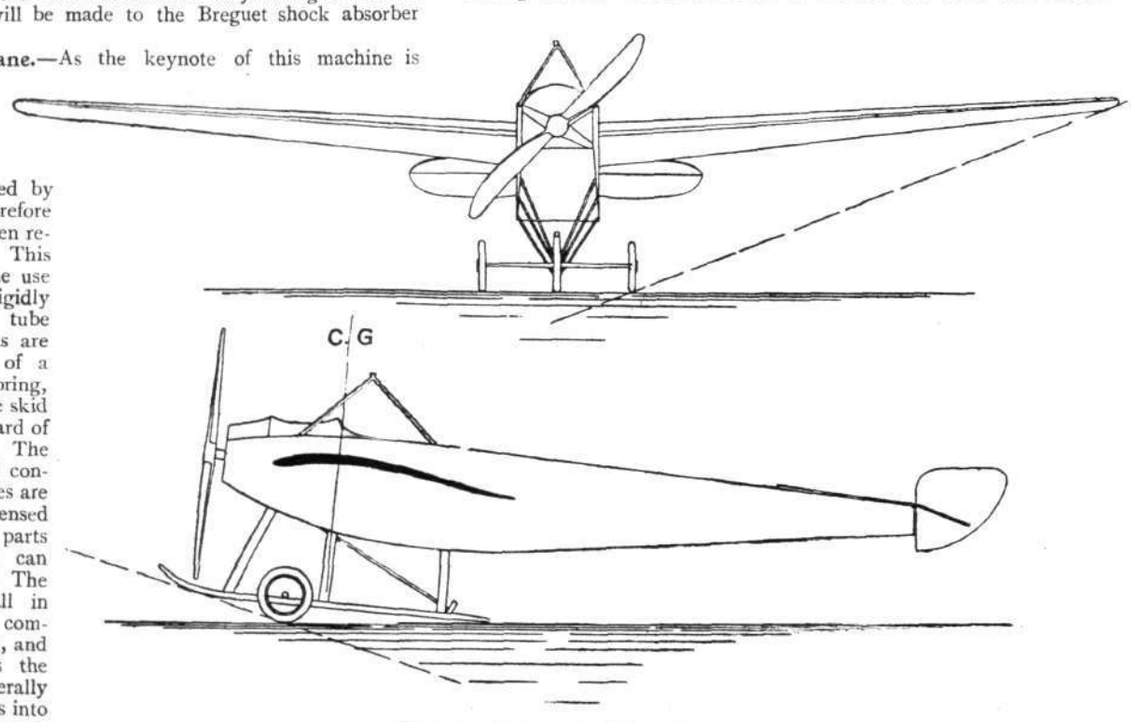


Fig. 5.—Nieuport Monoplane.

The efficiency of its primary function as a landing gear has often been doubted, but from practical results it would seem to be better than usually supposed. I have to thank Lieut. Barrington-Kennett, of the Air Battalion, R.E., for some of the notes on this machine.

Cody Biplane.—The undercarriage of this machine is chiefly constructed of wood, and has a central-skid between the main rolling-wheels; on the front end of this skid are fixed two smaller wheels. The rear-skid is a comparatively short distance behind the main-wheels, thus giving the machine a short base of support; but, owing to the high centre of thrust, the rear-skid carries little or no weight after the first few yards. The main-wheels have a track of about 3 feet, and support the machine through two spiral springs, which give a maximum travel of about 10 inches. The propeller

is placed comparatively high up, and advantage is taken of the fact of the bottom pane being correspondingly low by keeping the wheel-track narrow, and providing small wheels at the end of the lower main-planes. These are normally clear of the ground, but come into action if the machine is canted over sideways.

Brakes.

After alighting, it is desirable, and sometimes essential, to bring a machine to rest in a short distance. For instance, a good landing may be made in a confined space, but considerable damage may be done by the machine running into some obstruction, as generally the only braking effect is provided by the rear-skid; and this is often almost negligible, especially in the case of a machine with a non-lifting tail. Various forms of brakes have been suggested, and these often take the form of a dragging-skid, which is let down from a certain part of the machine into contact with the ground. It is difficult to realise that any such device can be efficient when taking the various conditions into consideration. In the first place, the skid and its gear must be of very substantial construction, as, unless it be capable of supporting practically the whole weight of the machine, the braking effect would be comparatively small, and, in any case, the extra weight and resistance would be considerable. Also, it must be suitably sprung, or the shocks transmitted to the machine while running on bad ground will be excessive. Air-brakes have also been advocated, and generally take the form of small planes, which are held flat against the sides of the main body of the machine, and are swung out to present a normal surface to the direction of motion in order to slow the machine down. Any form of air-brake is of little use, owing, in the first place, to its inefficiency at slow speeds (when most needed), and, secondly, it may actually help the machine along if used in a following wind.

Probably the most suitable brake is one acting directly on the main wheels, and may be of the tyre, rim, or band type; if it is found necessary to use some form of non-skid tyre, the tyre-brake will obviously be unsuitable, but in either case the extra weight and resistance need be very small. In addition to the advantage of bringing the machine quickly to rest, the brake may be used for holding it when starting and running the engine, and also to prevent running back after landing on an incline.

Steering Gear.

The provision of an efficient device for steering the machine on the ground is, if possible, more important than the fitting of brakes. If the starting or alighting ground is very confined, there must be a considerable risk when rolling with a machine which has inferior steering arrangements; but in the case of one provided with suitable brakes and steering-gear, the chance of accidents on the ground is very considerably reduced. The Farman-type machine is rather by accident than design provided with a fairly good steering-gear, without the addition of any parts over those used for steering when in the air. The rudder is placed at the rear of the machine, and is directly in the propeller slip stream, so that, even when stationary, the rudder is in the equivalent of about a 40-mile-an-hour wind, and it is therefore possible to steer the machine while the propeller is running fast; but if a landing is made with the engine stopped, this control is lost, and likewise, in the event of a side-wind, the machine has a tendency to swing round head to wind, even if the rudder is put hard over.

In the case of the Blériot-type machine, the conditions for ground steering are worse, because, owing to the propeller being in front, the rudder is not affected to the same degree as in the Farman type.

A steering device which is always certain in action, can be obtained by pivoting the rear skid and working it from the same wheel or foot bar that operates the rear rudder; in this case the machine can be steered on the ground independently of any side winds, and it does not rely on the propeller slip stream. This system has been tried out on the latest experimental machine constructed at the Army Aircraft Factory, and has proved to be efficient.

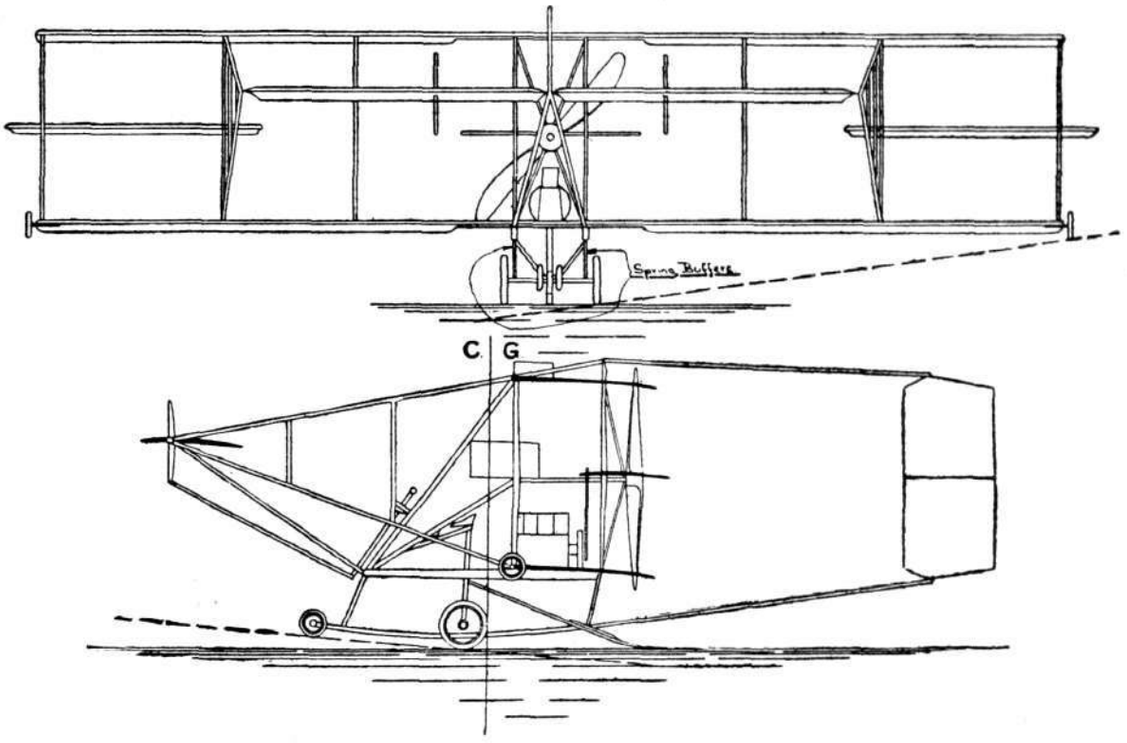


Fig. 6.—Cody Biplane.

Rubber Springs.

Rubber is largely used for shock absorbers in place of steel springs owing to its lightness and adaptability to various systems of suspension. Fig. 7 is a chart showing the extensions of ordinary rubber bands against fabric covered rubber cable; it will be noticed that the latter gives a proportionately higher loading as the travel increases, which fact is an advantage in most cases, especially in connection with the lateral stability of a machine when rolling, as the higher resistance of the cable meets the increased loading before the machine is canted over to the extent that would be possible if plain rubber bands were used. Rubber cable has better lasting qualities owing to the protection afforded by the fabric covering, and has a higher ultimate stress due to the additional resistance of the fabric.

Suspension.

Returning to the matter of suspension, a shock-absorbing device is not alone sufficient to meet the requirements of landing and rolling on uneven ground. In the first place, it is necessary to provide some kind of "undamped" spring between the main body of the machine and the wheels, in order that the latter may ride over the inequalities of the ground when rolling without transmitting these movements to the whole machine. For instance, supposing an aeroplane to be rolling at a speed of 30 miles per hour, and the wheels come into contact with a small mound 6 in. high, with a slope of 45°, then the direction of motion of the machine should remain practically unchanged, while the vertical velocity of the wheels will be 44 ft. per sec., but if the springs are in any way damped, very heavy strains will be transmitted to the whole structure.

In landing, the requirements are different. If the machine is gliding, it will be descending with uniform velocity, as the planes are carrying the weight, whereas if it drops a certain distance without load being taken by the planes, then it will be the same as a falling weight, having acceleration. This latter condition may be brought about by taking "way" off the machine by tilting it back till the planes cease to lift, or by a following gust of wind, which may considerably diminish the horizontal speed relatively to the air, and therefore cause the machine to lose a portion of its lift.

Both these conditions of alighting require some device to *absorb*

the shock when striking the ground, and ordinary springs or rubbers are not capable of doing this, as the momentum is not destroyed in overcoming resistance, but is stored in the spring, and is given out again by the machine rebounding. It is necessary to absorb work, and one of the most efficient methods of doing this is by means of an oil dash-pot as provided on the Breguet machine. A shock absorber of this type is shown in Fig. 8. It is composed of two telescopic tubes, the lower one, which may be called the cylinder, being attached to the axle of the rolling wheels, and the upper tube or piston to the main frame of the machine. When fully extended, the cylinder is full of oil, a cup leather being provided to prevent leakages between the surfaces; when the wheels meet the ground, the oil is displaced into the upper tube through a spring-loaded valve, which is set open at a pre-determined pressure.

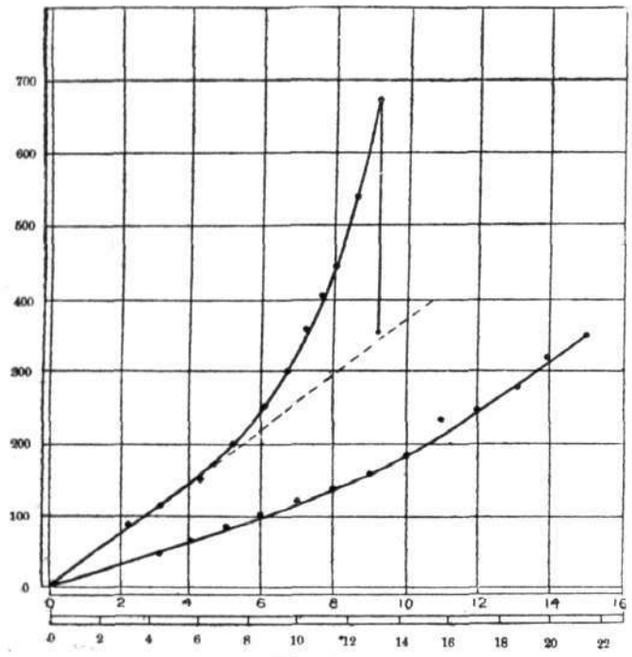


Fig. 7.

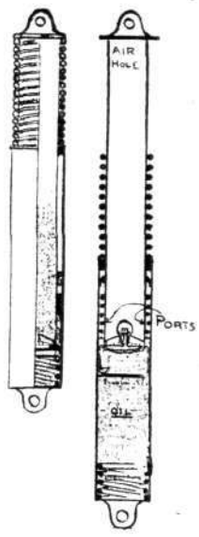
While resting on the ground, the weight is taken by the helical spring, which does duty while rolling, at the same time the valve is held open by a third spring, and therefore there is practically no damping effect from the oil, which can pass freely through the ports. The oil passes from the upper tube to the lower one through the central back pressure valve, while a small air-hole in the top of the piston tube allows for the displacement of the oil.

The chart, Fig. 9, shows the sort of diagram given by a shock absorber of this type, while the other curves show the results obtained by using ordinary undamped springs.

Conclusions.

Having considered the various conditions to be fulfilled, we may now review the various undercarriages at present in use, with the object of seeing how far they meet the case. It must be remembered that we are dealing with conditions that apply to the unsuitable kind of ground before mentioned, and not to the comparatively level surface that is usually chosen for alighting.

In the first place, the majority of aeroplanes are wanting in some form of front support, sufficiently far forward of the centre of gravity to make it impossible for the machine to turn over when the wheels are suddenly retarded. The next most important point is the want of a real shock-absorbing device in place of the usual springs or rubber bands, while the provision of efficient brakes and steering gear is equally essential. There are, of course, individual cases where some of these conditions are fulfilled, as, for instance, on the Breguet, which is provided with a mechanical steering device and efficient shock absorbers, but, in the majority of cases, these features are wanting. However, these, with other improvements, must eventually be provided to give the aeroplane its greatest possible range of utility.



Closed. Fully extended.

Fig. 8.—Breguet-Type Shock Absorber.

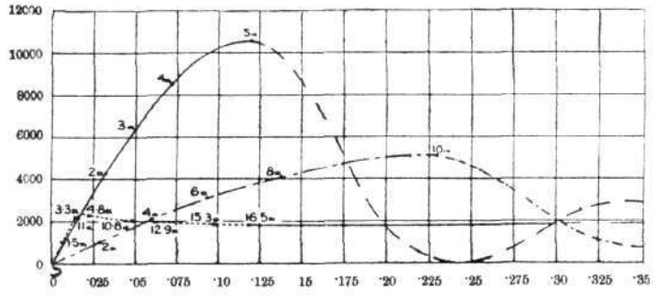


Fig. 9.

⊛ ⊛ ⊛ ⊛

LONDON-PARIS RECORD FLIGHT.

SALMET'S magnificent flight on Thursday of last week from the Hendon aerodrome to Paris, in a wind averaging the whole way a velocity of 30 miles an hour, brands him as one of the foremost airmen of the day—a second Vedrines. His aim was to effect the return journey between the two capitals in one day, and to shorten his course he elected to cross the channel at its widest part, from Eastbourne to Dieppe—a feat which has hitherto never been accomplished. For nearly two hours he was obliged to steer by his compass alone, being above the clouds. That he succeeded in maintaining his true course under such difficult conditions is indeed eloquent testimony of his ability as a pilot. From the time he left Hendon to the time he landed at the parade ground of Issy-les-Moulineaux near Paris, 3 hours 16 mins. elapsed. Of this time 13 minutes was occupied at Eastbourne in gaining altitude, and for 17 minutes he had to circle near Gisors in order to determine his whereabouts. Subtracting these 30 minutes from his total time, his true time for the direct flight was 2 hours 46 mins. His real average speed between the two capitals, a distance of 220 miles, in direct flight was therefore 79 miles an hour—a truly wonderful speed when one takes into consideration the fact that it was Salmet's first cross-country journey.

Starting on his return journey from Issy-les-Moulineaux at 2.15, he fought his way against wind and rain to the coast, but, through lack of petrol, had to descend at Berck Plage at 5.55. Here he thought it advisable to remain the night, in spite of his determination to reach English soil if possible that day. The following morning he set off once more, and following the French coast line to Cap Grisnez, which he reached at eleven o'clock, he steered towards the English coast, effecting the crossing of the Channel in 15 mins. Continuing on, he was obliged to descend at Chatham, owing to the violent wind and rain. Early on the following morning he started again, but at Maidstone was forced to descend through encountering a bank of fog. In landing, the tip of his propeller, a Levasseur, was damaged, and another one had to be obtained from Hendon. Once more he started, but before he had got far his motor suddenly stopped, and he was obliged to plane down into a football field not more than a few hundred yards from the Royal Albert Docks. To land in such a small ground necessitated a steep *vol piqué*. To avoid a goal post he had to elevate sharply, and in consequence lose speed to such an extent that the wind got the better of him, and his monoplane came heavily to earth. It was considerably damaged, but happily, barring the shock, Salmet was little the worse.

Elsewhere in this issue will be found an account of this trip to Paris from the pen of the aviator, M. Henri Salmet, himself.

⊛ ⊛

The Ladies A.C. and Aviation.

ARRANGEMENTS have been made by the Ladies Automobile Club for a lecture to be given at the Club Rooms, at Claridge's Hotel by Mr. B. H. Barrington-Kennett on Tuesday, April 2nd, at 3.30 p.m., the subject being "Aviation at Home and Abroad." The lecture will be illustrated by lantern slides and cinematograph views.

AVIATION IN AUSTRALIA AND PIONEERS.

MR. G. W. WHATMORE of Melbourne sends a communication, which we give below, in regard to pioneer aviation work in Australia, Mr. Whatmore writes as follows :

" Some misconception appears to exist as to the actual history of aviation in this country. In fairness to Mr. Hammond, I trust that you may see your way to publish the information contained in the enclosures to put your readers into possession of the actual history of aviation in so far as it applies to Australia.

" For this purpose I forward you some photographs of actual flights made in Melbourne, and in one of which you will observe

Mr. J. J. Hammond, the Australian aviation pioneer.

Hammond on the point of starting with two passengers, and another just alighting with Mrs. Hammond, it being the first occasion of a lady passenger being carried in Australia.

" The following is a brief history of aviation in Australia :—

" Some two years ago, Mr. A. L. Adamson sent Mr. Defries to England and France for the purposes of introducing aviation into Australia, a Blériot monoplane and a Wilbur Wright biplane being the outcome. On arrival, however, of these machines, though they in themselves were perfect, there was unfortunately at that time no pilot capable of manipulating same, and although several attempts were made by Mr. Defries, yet in every instance they ended unsuccessfully, not on any occasion had either machine left the ground.

" The fate of the machines was ignominious. They were introduced under bond with an exorbitant duty, payable in the event of their being retained permanently in the Commonwealth, the upshot being that they were eventually dismantled of their engines, and the remaining parts shipped to " Davy Jones' Locker," in other words, cast into the sea.

" The next attempt was made by Gaston Cugnet on a Blériot monoplane. Excepting for one occasion no successful flights were made, and even this one only of seven minutes duration. On landing, however, he bumped into a cow with more damage to the machine than the cow. Mons. Cugnet next attempted to fly from the Melbourne Cricket Ground in the presence of 25,000 spectators, but had not sufficient run to obtain the necessary elevation, with the consequence that the tail of the monoplane fouled the pallisading round the cricket ground, and the machine was gathered up in fragments. This was in January, 1911.

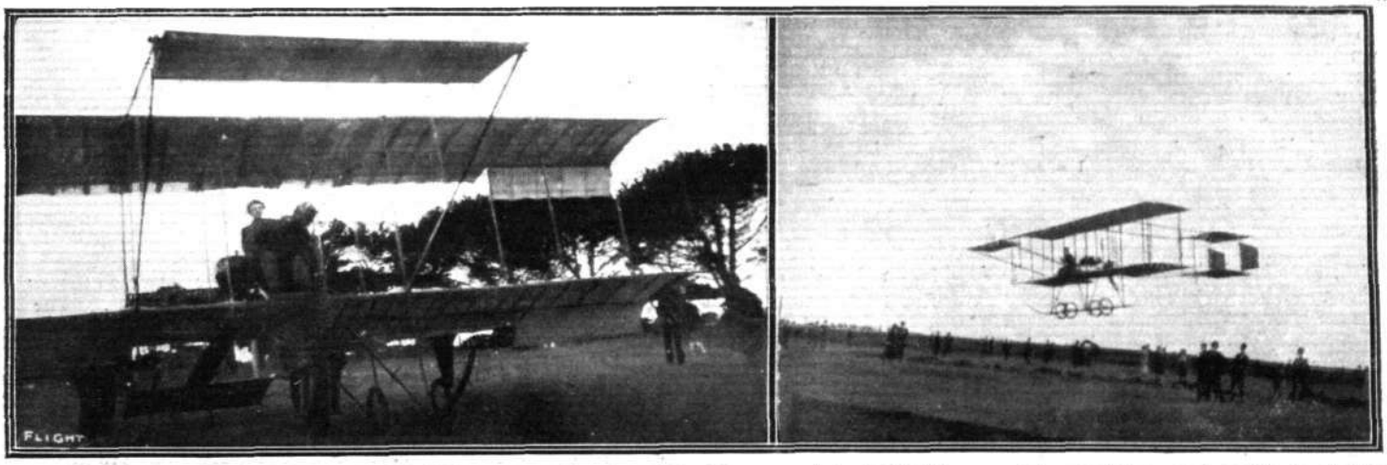
" Mr. Houdini, with a Blériot monoplane, next essayed an attempt at Rose Hill Racecourse, in Sydney, N.S.W., but on two occasions on which he flew he was only in the air a few minutes, and this at an altitude of only 150 ft.

" The next attempt which brought aviation before the Australian public in a manner worthy of the name, giving an example of the extraordinary performances in England and the Continent, was made by Mr. J. J. Hammond, the accredited pilot of the Bristol Co.

" The succession of successful flights made by Mr. Hammond in the chief cities of the Commonwealth became the sole topic of conversation at the time of their taking place. In reality they were the first and only successful flights witnessed in Australia.

" Starting in Perth, West Australia, in December, 1911, to the bewilderment of the inhabitants of that city, Mr. Hammond flew from Belmont Race Course over the city, across King Park and back to the starting place, a distance of 20 miles. He even flew down the Swan River and back again to the city on another occasion, a 35 miles flight. After several other flights in Perth, the Bristol biplane was then shipped to Melbourne where the success was again repeated. The first flight being to Geelong, 45 miles, returning the next day, a total of 90 miles. The most sensational flight in Victoria was made over the city of Melbourne, where at an altitude of 7,000 ft. Mr. Hammond flew all over the city and suburbs, over the dome of the Exhibition, round Government House tower and across the broad area of Hobson's Bay alighting at Altona Bay, his starting place, after having covered a distance of 35 miles. He made upwards of 20 successful flights whilst in Melbourne, and was the first aviator to carry a passenger in Australia. The honour of being the first lady passenger falling to the lot of his wife, followed by Mrs. Harvey Patterson, Mrs. Cecil Lebin and Mrs. Edwards, whilst Mr. M. H. Baillie was the first gentleman passenger, subsequent passengers being Messrs. Knox, Bick, H. V. McKay (Sunshine Harvester), Hugh McKay, junior, and Edwards of the Continental Tyre Co., and the representatives of the leading daily journals.

" Mr. Hammond also on one occasion took his two mechanics, Messrs. McDonald and Coles, on a short flight. The machine was then taken to Sydney where the successful Victorian flights were repeated to the astonishment of the inhabitants of the latter city. Amongst the passengers there being Col. Anthill (A.D.C. to General Gordon), whilst a military officer, Capt. Niechy, was carried from Sydney to the military encampment at Liverpool, a distance of 25 miles, landing in the presence of the Governor-General, Lord Dudley and the Officer Commanding, General Gordon, on which occasion Mr. Hammond received an ovation. Mr. Hammond then resigned charge of the Bristol biplane and his place was filled by Mr. McDonald, who made some very successful flights, but it will be clearly seen that the honour of being the first successful aviator in Australia is due to Mr. Hammond."

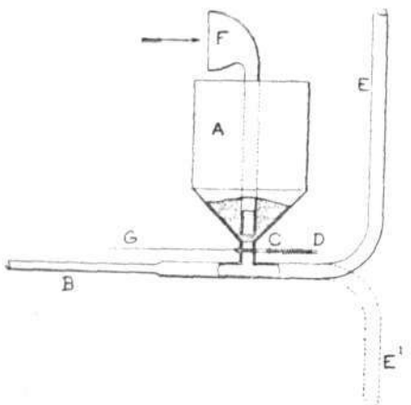


The two photos sent by Mr. G. W. Whatmore, showing Mr. Hammond just alighting on his machine, and ready to start with Mrs. Hammond, the first occasion of a lady passenger being carried in Australia.

A NEW METHOD OF SIGNALLING FOR AEROPLANES.

THE JAMES MEANS' DEVICE.

IT is an established fact that the maintaining of communication between a machine in the air and a point on land, is a serious factor when determining the value of the aeroplane as a scout. Up to the present wireless telegraphy or telephony have been regarded as the means to which we shall have to look for the solution of the problem, but, in this connection it must be mentioned that although messages have been successfully sent from a machine to the ground, considerable difficulty exists in deciphering messages sent from the ground to a machine in flight. This is due to the limited length of the "aerial" or collecting wires it is possible to use on an aeroplane



and also to the fact that in most present systems, messages are received in the form of faint buzzes through a sensitive telephone receiver, which are extremely difficult to distinguish in view of the vibrations and noise emanating from the engine.

As the science of aviation and the development of engines proceed, there will, no doubt, come a time when engines will become sufficiently smooth running and silent for this means to be effective. In the meantime, however, a suggestion the invention of Mr. James Means and marketed by Browne and Woodworth, 60, Congress Street, Boston, Mass., comes from America, which, at least, has some points to commend it in that, with quite a simple apparatus, it would be possible to establish communication not only between a machine in the air and the ground station, but between two aeroplanes in flight. Instead of making use of the waves set up by an electric discharge, the system merely employs light-waves, set up by the intermittent discharge of lamp black from a nozzle, and collected by a no more complicated apparatus than the human eye, or that organ assisted by an ordinary pair of binoculars. A sketch of the device accompanies these few lines. A is a receptable containing a supply of lamp black, which is released into the tube, E, by means of the shutter, C, controlled by a wire, G, from the pilot's seat. A funnel, F, directed towards the relative wind is continued in the form of a tube to a point just above the shutter, C, in order that the air pressure established in the tube may assist the gravity feed of the lamp black. Lamp black introduced into the tube, E, is discharged into the atmosphere by the exhaust gases of the motor, which are conducted from the motor by the tube, B.

For those aeroplanes employing motors in which it is an impossibility to trap the exhaust gases, that is in motors of the rotary variety, another device has been designed, a steel bottle of compressed air forming the means whereby the lamp black is ejected.

The signals are given by pulling the cord G, which causes a puff of lamp black to escape from the nozzle of the tube E. Short and long puffs correspond to the dot and dash of the Morse telegraphic code.

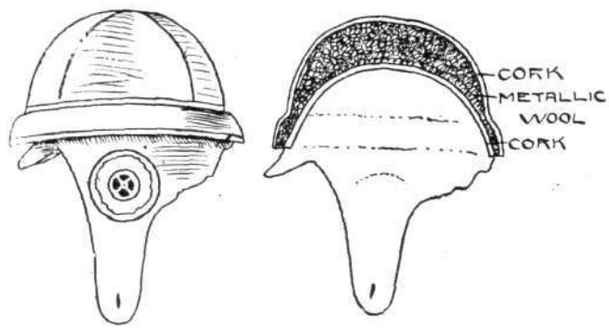
While being simple in its conception and operation, and readily fitted to any existing type of aeroplane, it has the failing that its effective radius is limited to the distance over which the lamp black discharges are visible. This, to a certain extent, is governed by the puffs discharged, and consequently by the size of the apparatus employed. Tests have already been carried out on a small signaller weighing about 30 lbs., and with this the signals have with the aid of field glasses been quite distinguishable at a distance of over four miles. The inventor points out that aeroplanes have been constructed to carry 1,000 lbs. of useful load in the form of passengers, and that it would be possible to carry a signalling device of 33 times the capacity. He, therefore, contends that it is merely a matter of arithmetic to arrive at the distance over which these signals could be effectively transmitted.

It would be interesting to learn what radius of effectiveness the apparatus has, in comparison with other means of daylight signalling, the heliograph for example.

⊛ ⊛ ⊛ ⊛

A SAFETY HELMET.

HOW seldom it is one sees an aviator wearing a safety helmet these days! For this, the reason is rather difficult to define, unless it be that, in common with others, aviators dislike to be reminded of the risks they are running, however small they may be. Is it not true that many people take exception at the rows of lifebelts displayed on a steamer on the score that they remind them that there is a slight element of danger? What thanks would an able bodied seaman give one for the advice that he really should learn to swim, as at any time a shipwreck is possible and his life may depend upon that capability? Nevertheless, many aviators at the present day owe their lives to the use of safety helmets. Indeed, they would have deserved little sympathy had they met their deaths through omitting to make use of this safeguard. Safety helmets may be rather unsightly to wear, but are not goggles equally unlovely? Among the many helmets aviators have to choose from—all excellent in their way—the Maison Roold, of 50, Avenue de la Grand Armée, Paris, market one which they claim is especially effective. Both the outside case and the interior lining are made from cork, and the space between is packed with metallic wool. Many other useful



accessories for the satisfaction of the minor requirements of the flying man do the Maison Roold supply. Aviation suits and unbreakable goggles figure among them.

⊛ ⊛ ⊛ ⊛

PAU TO PARIS IN ONE DAY.

THE records of Capt. Bellenger and Vedrines in flying between Pau and Paris were put in the shade on Monday last, when Tabuteau on his Morane monoplane succeeded in making the journey in one day with only a rest at Poitiers, and a short stop at Etampes to change a plug. He started from Pau at a quarter past seven in the morning, and three hours later landed at the Chauvinerie ground at Poitiers, after a journey of 420 kiloms., as though he had been making just an ordinary cross-country trip. He was somewhat tired, as from Aire-sur-l'Adour he had to fight his way through the rain to Angouleme, but otherwise was quite all right. After resting awhile, he felt quite fit again, and at 2.50 p.m. set out with the object of getting to Villacoublay. He caused some surprise at Etampes, where he landed *en route* in order to change a faulty plug, an operation which took 10 mins. The news of Tabuteau's departure from Pau, and later from Poitiers, attracted a large crowd to Villacoublay in order to see him arrive and a great shout went up when at a quarter past five a monoplane was sighted. Ten minutes later he landed, having covered the 300 kiloms. in 2 hrs. 35 mins.

During the first stage of the trip his speed had averaged 148 kiloms. an hour, but during the second it was a good deal slower, 118 k.p.h. to be exact. His net flying time for the full distance of 720 kiloms. between Pau and Villacoublay was 5 hrs. 35 mins. giving an average speed over the full distance of 129 k.p.h.

The Royal Aero Club of the United Kingdom

OFFICIAL NOTICES TO MEMBERS

Annual General Meeting.

The Annual General Meeting of the Members of the Royal Aero Club of the United Kingdom will be held on Thursday, March 21st, 1912, at 4 o'clock, at 166, Piccadilly, London, W.

Agenda.

1. To elect Hon. President, Vice-President and Council for the ensuing year. The following are recommended by the Committee for re-election :—

Hon. President—His Grace The Duke of Argyll, P.C., K.T., K.G., G.C.M.G., G.C.V.O. ; *Vice-President*—Field-Marshall The Right Hon. Earl Roberts, K.G., K.P., V.C., G.C.B., G.C.S.I., G.C.I.E.. O.M. ; *Council*—S.A.I. Prince Roland Bonaparte (President F.A.I.) ; H.S.H. Prince Blucher von Wahlstatt ; His Grace The Duke of Sutherland, K.G. ; The Right Hon. The Earl of Crawford and Balcarres, K.T., LL.D., F.R.S. ; The Right Hon. The Earl of Hardwicke ; The Right Hon. The Earl of Lonsdale ; The Right Hon. Lord Howard de Walden ; The Right Hon. Lord Kinnaird, F.R.G.S. ; The Right Hon. Lord Suffield, P.C., G.C.V.O., K.C.B. ; The Right Hon. Lord Montagu of Beaulieu ; The Right Hon. Lord Llangattock ; Admiral of the Fleet, The Right Hon. Sir Edward Seymour, P.C., G.C.B., O.M., G.C.V.O. ; Admiral The Hon. Sir Edmund Fremantle, G.C.B., C.M.G. ; Count Henry de la Vaulx (Vice-President Aero Club de France) ; Sir David Salomons, Bart. ; Sir Norman Lockyer, K.C.B., F.R.S. ; Professor Sir William Crookes, O.M., F.R.S. ; Sir Hiram S. Maxim ; The Right Rev. Bishop Welldon ; Martin Dale.

2. To announce result of ballot for Committee.

3. To confirm rule

CONTROL OF COMPETITIONS.

The Royal Aero Club of the United Kingdom has the sole control of all competitions, sporting events, or trials in connection with Aeronautics in the United Kingdom. The exercise of this control shall be vested in the Committee who may for this purpose from time to time make, alter, or amend such rules and regulations as it may think proper. Any person, whether a member of the Club or not, who shall disregard any such rules and regulations, or take part in any competition not authorised by the Club, shall be liable to such penalty of suspension or disqualification as the Committee may think fit to pronounce. The Committee may grant permits for competitions, sporting events, or trials, and may delegate its powers of suspension or disqualification to other Clubs or persons with or without appeal to the Committee. Powers of temporary suspension may be delegated to any steward or judge appointed for any Meeting.

Right of Appeal.—If any person is aggrieved by a sentence of suspension or disqualification under the Competition Rules, he shall have a right of appeal to the stewards of the Royal Aero Club, who shall give an opportunity to the parties of stating their case and tendering evidence. A sentence pronounced by the stewards of the Royal Aero Club shall be final and without appeal (except in the case of International competitions) and shall be binding on all persons for all purposes. The stewards of the Club or the Committee may authorise a statement to be inserted in the official organ of its decision under this rule.

Election of Stewards.—There shall not be less than six, nor more than twelve stewards of the Royal Aero Club, who shall be elected annually in April by the Committee of the Royal Aero Club. They must be members of the Royal Aero Club, and must not have any direct financial interest in the aircraft trade.

Proceedings.—The stewards of the Royal Aero Club shall appoint their own Chairman and Secretary, and fix their own meetings. The quorum shall be three.

By Order of the Committee,
HAROLD E. PERRIN, Secretary.

Names of Members Proposed for the Committee.

1. Barber, H.
2. Barrington-Kennett, Lt. B. H.
3. *Bucknall, Ernest C.
4. *Capper, Col. J. E., C.B., R.E.
5. *Cockburn, G. B.
6. Delacombe, Harry
7. Fulton, Capt. J. D. B., R.F.A.
8. Grunhold, C. G.
9. Lloyd, Major F. Lindsay
10. *Manville, E.
11. May, Fred.
12. *Moore-Brabazon, J. T. C.
13. Neill, Norman Clark
14. Roe, A. V.
15. *Rose, Sir Chas. D., Bart., M.P.
16. Samson, Commander C. R., R.N.
17. *Singer, A. Mortimer
18. *Stanley, Hon. A., M.P.
19. Tullibardine, The Marquess of, M.V.O., D.S.O., M.P.
20. *Wallace, R. W., K.C.

A ballot paper for the election of nine candidates to seats on the committee of the club has been forwarded to each member.

1. No ballot paper which is signed, or on which the number of candidates voted for is more or less than the number of vacancies, or which is received by the secretary later than **12 o'clock noon, Wednesday, March 20th, 1912,** will be valid.

2. The number of members to be elected is **9.**

3. Members must be careful therefore to strike out **11** names, so as to leave **9** only for whom they vote.

4. The names of the retiring members of the committee are indicated by an asterisk.

Scrutineers of the Ballot.

The following scrutineers have been appointed :—J. Stewart Mallam (Andrew W. Barr and Co., Chartered Accountants) ; F. Harold Sully (I. and A. W. Sully and Co., Chartered Accountants).

Committee Attendances during the Past Year.

EXECUTIVE COMMITTEE. Meetings held, 46.

Griffith Brewer	35	E. Manville	—
Ernest C. Bucknall	41	J. T. C. Moore-Brabazon ...	23
Col. J. E. Capper, C.B., R.E.	11	Alec Ogilvie	22
*G. B. Cockburn	15	M. O'Gorman	34
Capt. B. Dickson	11	C. F. Pollock	40
John Dunville	1	Sir Chas. D. Rose, Bart., M.P.	16
Col. H. C. L. Holden, C.B., R.A., F.R.S.	20	A. Mortimer Singer	14
Prof. A. K. Huntington ...	41	Hon. Arthur Stanley, M.P....	—
F. K. McClean	25	R. W. Wallace, K.C. ...	41

* Mr. G. B. Cockburn has attended all meetings since his election to the Committee on 21st November, 1911, viz., 15.

COMPETITIONS COMMITTEE. Meetings held, 17.

F. P. Armstrong	4	Major F. Lindsay Lloyd ...	9
G. Brewer	4	J. T. C. Moore-Brabazon ...	4
Ernest C. Bucknall	15	Alec Ogilvie	9
G. B. Cockburn	15	M. O'Gorman	13
Col. H. C. L. Holden, C.B., R.A.	11	A. Mortimer Singer	1
Prof. A. K. Huntington ...	10	R. W. Wallace, K.C. ...	4

FOREIGN CONFERENCES, ROME. Meetings held, 1.

R. W. Wallace, K.C. ...	1	Capt. Bertram Dickson ...	1

Committee Meeting.

A meeting of the Committee was held on Tuesday, the 12th inst., when there were present :—Prof. A. K. Huntington, in the Chair, Mr. Griffith Brewer, Mr. Ernest C. Bucknall, Mr. G. B. Cockburn, Col. H. C. L. Holden, C.B., R.A., F.R.S., Mr. F. K. McClean, Mr. J. T. C. Moore-Brabazon, Mr. Alec Ogilvie, Mr. Mervyn O'Gorman, Mr. C. F. Pollock, Mr. R. W. Wallace, K.C., and Harold E. Perrin, Secretary.

New Member.—The following new member was elected :—Major A. W. Peck.

Aviators' Certificates.—The following Aviators' Certificates were granted :—

194. Capt. Patrick Hamilton (Deperdussin, Brooklands).
195. Lieut. Cecil John L'Estrange Malone, R.N. (Short biplane, Eastchurch).
196. Capt. George Hebden Raleigh (Bristol biplane, Brooklands).
197. Ronald Louis Charteris (Deperdussin, Brooklands).

The request of the Aero Club de France to grant an aviator's certificate to Mr. James Grant was sanctioned.

London to Paris Flight.—The committee unanimously resolved that a letter be sent to Mr. H. Salmet congratulating him on his record non-stop flight from London to Paris.

Competitions Committee.

The Competitions Committee met at the Royal Automobile Club (by kind permission) on Tuesday last, the 12th inst. Present : Col. H. C. L. Holden, C.B., R.A., F.R.S., in the Chair ; Mr. E. C. Bucknall, Mr. G. B. Cockburn, Prof. A. K. Huntington, Major F. Lindsay Lloyd, Mr. F. K. McClean, Mr. Alec Ogilvie, Mr. M. O'Gorman, and H. E. Perrin, Secretary.

The Competition Rules of the Royal Aero Club were finally considered and approved.

General Regulations for Preventing Collisions in the Air.

The regulations were drawn up and it is hoped to publish them next week.

Mr. M. O'Gorman and Mr. R. W. Wallace, K.C., who are

attending the Federation Conference in Paris on the 15th and 16th instant, will move the adoption of these regulations by the Fédération Aéronautique Internationale.

Aviation Accidents.

The Club has appointed a Special Committee, with Col. H. C. L. Holden, C.B. R.A., as Chairman, to enquire into the causes of aviation accidents.

The Aeronautical Society has accepted the invitation of the Club to nominate three representatives to this Special Committee.

Presentation of Medals.

At the annual general meeting to be held at the Club on Thursday next, the medals awarded by the Club during the last two years will be presented.

It is hoped that Field-Marshal the Right Hon. Earl Roberts, K.G., K.P., V.C., &c., Vice-President of the Club, will attend and make the presentations.

Austrian International Aviation Meeting.

An International aviation meeting will be held at Vienna from June 23rd to 30th, 1912, under the auspices of the Aero Club of Austria.

Among the various events there will be competitions for height, speed, vertical speed, cross-country race, variability of speed, bomb dropping, landing, pursuit of balloons, &c. The prizes will probably amount to about £7,000.

Further particulars can be had on application to the Club.

Presentation of Lantern Slides.

Mr. E. T. Willows has kindly presented to the club a collection of lantern slides dealing with the Willows airships.

Army and Navy Aviation Prizes.

Intending competitors are again reminded that this competition closes on March 31st, 1912.

The best performances so far recorded are as follows :—

Army.—Lieut. B. H. Barrington-Kennett, 249½ miles.

Navy.—Lieut. A. M. Longmore, R.N., 180½ miles. (This distance is subject to verification.)

Presentation to the Library.

Mr. Mervyn O'Gorman has kindly presented a bound copy of his paper on "Problems relating to Aircraft" to the library.

New York Aeronautical Exhibition.

The First International Aeronautical Exhibition will be held in New York on May 9th—18th, 1912, under the auspices of the Aero Club of America. Particulars can be obtained on application to the Secretary of the Royal Aero Club.

Aviation Lantern Slides.

The Royal Aero Club has acquired a large collection of lantern slides dealing with aviation, and members can hire these at a nominal fee.

In order to make the Club collection more complete, the Committee will be glad to receive gifts of slides, and negatives or photographs from which slides can be made.

166, Piccadilly. HAROLD E. PERRIN, Secretary.

⊛ ⊛ ⊛ ⊛

ROYAL AERO CLUB FLYING GROUND, EASTCHURCH.

FOR the greater part of last week the weather was not good, and only the usual practice was done by the pupils taking advantage of the early morning calms.

On Friday morning, Lieut. L'Strange Malone, R.N., took his *brevet* with an excellently-controlled flight, which justified the expectations formed by those who have watched his tuition flights. Possibly the hardest part of the Royal Aero Club's test, for a beginner, is that of landing in a neat manner within 50 yards of the landing mark, a test which Lieut. Malone accomplished quite easily.

A decidedly strong wind was blowing on Saturday, and most of the aviators were out in it. Ogilvie was first up on the N.E.C.-engine Wright machine, and was followed by Commander Samson, R.N., on the Short monoplane. Other aviators were Capt. Gerrard, R.M.L.I., who was altitude climbing on the No. 38 biplane, and Lieut. Longmore, R.N., and Capt. Gordon, R.M.L.I., the former with Capt. Payne, of H.M.S. "Actaeon," making a long cross-country tour.

Capt. Carden was also practising on the Dunne biplane in the afternoon.

Some excellent aerial manœuvres were carried out by Commander Samson and Capt. Gerrard, whose spiral *vol planés* are well worth witnessing. The latter climbed twice to a height of 2,200 feet, from which altitude he descended in a spiral, with his engine completely stopped, landing at a point almost immediately beneath him.

On Sunday McClean was flying his favourite machine, the 70-h.p. Short tractor biplane, which he took for a flight over Sheerness with Commander Samson as a passenger.

Later in the day Jezzi was very busy on his Jezzi biplane, and made a good many laps of the aerodrome. His machine, although of such small dimensions, has proved its passenger-carrying capacity already, and several passengers were taken up singly by Jezzi, including Mr. and Mrs. Fowler, J. L. Travers, and Mr. Kershaw.

Professor Huntington was out at the same time on his reconstructed machine, which is now in running order again.

Monday saw some flying for the Mortimer Singer prize, Lieut. Longmore, R.N., with E. R. A. O'Connor as a passenger, kept going for exactly four hours on the 70-h.p. Short tractor biplane, during which time he travelled, relative to the ground, some 196 miles. He had still sufficient fuel for a further 2½ hours flight and was quite comfortable, but after four hours running the engine began to pull badly and he returned to the aerodrome.

Capt. Gerrard, R.M.L.I., also put up a good performance by flying for nearly four hours on the triple twin, but owing to the increasing strength of the wind decided, after that time, to land and await more favourable weather conditions.

⊛ ⊛

Flying School for Manchester.

UNDER the auspices of the Manchester Aero Club an attempt is being made to start a flying school at the Aerodrome, Trafford Park. The fee has been fixed at £50, and should a sufficient number come forward, the necessary aeroplane, hangars, &c., will be provided, and fully qualified pilot instructors, engineer and assistants employed to give pupils thorough and completely efficient instructions. The club will also guarantee a Prize Fund to be awarded to those who first take out their certificates.

The Cody Biplane Carries Four.

WITH three officers of the Air Battalion in the passenger seats of his biplane, Mr. Cody, on Tuesday, made a very successful flight of about twenty minutes duration. At one time the biplane was at a height of 700 feet.

A Cross-Country Handicap from Brooklands.

APART from the motor car and cycle events which form the programme of the first meeting of the season at Brooklands to be held on Easter Monday, April 8th, there is to be an aeroplane handicap over an out-and-home cross-country course of about 10 miles. The entrant of the winning machine will receive fifty sovereigns or a cup. There will be a second prize of £20 or a cup, and a third prize of £10 or a cup. Entries close on March 27th, the fee being £1.

U.S. Postmaster-General is Far-Sighted.

THAT Postmaster-General Hitchcock, of the United States, looks well ahead is shown by the following extract from his Annual Report to President Taft :—

"The first aerial dispatch of United States Mail occurred in September last, when 43,000 pieces were carried from Aeroplane Postal Station No. 1, on Nassau Boulevard, to Mineola, Long Island. The progress being made in the science of aviation encourages the hope that ultimately the regular conveyance of mail by this means may be practicable. Such a service, if found feasible, might be established in many districts where the natural conditions preclude other means of rapid transportation."

A "Mystery" Aeroplane.

MANY of the residents of Warmley were considerably excited, says a local paper, at the imposing spectacle of a splendidly illuminated aeroplane passing over the village at a tremendous rate. Certain other people at Bristol and neighbouring places apparently saw the same spectacle, but their version of the story is that a brilliant meteor passed over the district. Aeroplanes are getting to be very speedy birds nowadays, but speeds enough to render machines incandescent have not yet been realised. Will some kind pilot go down to Warmley and show the inhabitants what an aeroplane is really like?

FROM THE BRITISH FLYING GROUNDS.

Brooklands Aerodrome.

ON Wednesday of last week the weather showed some signs of improving after a record period of bad wind and rain. Pizey was out on the Bristol, testing the air, with Nesham as passenger. The latter then made an excellent flight of about 10 mins., showing perfect control over the machine. Fleming was also up with Major Bannerman, who subsequently went with Pizey. The last-named pilot then gave Capt. Broke-Smith a passenger-flight, ending with instruction in landing and low-flying. Percival made some circuits with quaint turns over the sheds, machine showing calm indifference to the somewhat gusty wind prevailing. The Walter Edwards machine performed curves and straight flights 3 or 4 feet from the ground. The Flanders school was at work, Kemp flying good circuits, and Lark practising hops and short straight flights. Pizey, testing the Bristol Anzani monoplane, unfortunately burst a tyre on landing. While this was being repaired he took up the new biplane, being in the air at the same time as Fleming, who was carrying Major Bannermann. When near the Paddock, Pizey was struck by an extremely awkward gust, the machine being seen to oscillate to a steep angle on both sides. On referring to the recording anemometer, the wind was found to have made a variation for 3 to 30 m.p.h., so his experience must have been extremely unpleasant. During the afternoon the Dep. school was at work, Petre, Sabelli and Capt. Hamilton flying one circuit each. To-day another test was performed on the Martin-Handasyde wings. The plane stood up to a load of 34 cwt. of sand, at which point the stranded cable broke at the loop and let the wing down. Assuming that the disposition of the load on the plane was the same as that in actual flight, a point on which care was taken, the factor of safety works out at approximately 5, an allowance which one would consider amply high.

On Thursday the Flanders school was at work early, Kemp testing a new propeller and flying fine circuits and Lark making short straight flights. Capt. Hamilton was practising on the Deperdussin and making good straights. Percival's pupil, Cannon, was rolling on the school biplane. At the Bristol school Fleming was out instructing Capt. Broke-Smith and Major Bannerman; also Pizey with Major Bannerman, who afterwards did some rolling. Capt. Broke-Smith on the biplane, and Capt. Allen on the monoplane, both made straight flights. A rising wind then stopped proceedings until late towards evening, when Sopwith took Howard Wright for passenger trips on the Burgess-Wright. Kemp, considering the wind too tricky for pupils by themselves, took Lark for a passenger flight of several circuits. A large bank of heavy clouds portending a storm caused most of the machines to be brought in, but Percival stopped out, and had the misfortune to be struck by the rising wind when making a turn, causing machine to sideslip to the ground. Comparatively little harm was done except to the undercarriage, but owing to its being abandoned until next morning was blown over during the night and seriously damaged. To-day Capt. Hamilton after "rubbing up" his previous experience in flying, succeeded in obtaining his *brevet* in excellent style on the Deperdussin. At the same school Capts. Massey and Partridge were practising straight flights, while Petre flew circuits.

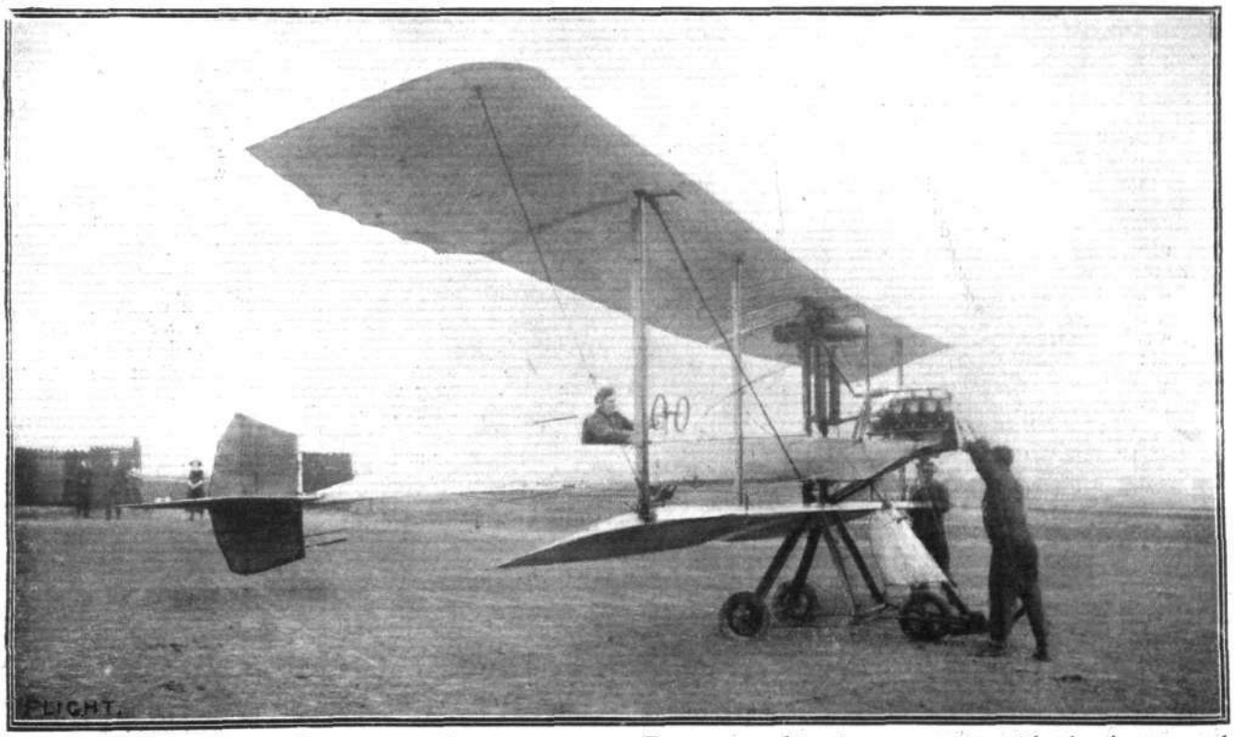
On Friday there was little flying, owing to the rain, but Partridge and Sabelli both managed to put in a few circuits on a Deperdussin first thing in the morning.

On Saturday morning, Petre flew one circuit in an unpleasant wind. Fleming was up on the Bristol with Major Bannerman, and later with Capt. Broke-Smith. Capt. Raleigh flew some good circuits and Major Bannerman straights, getting off and landing well. Lane was rolling on the Bristol monoplane. Kemp on the Flanders flew several circuits.

On Sunday, Manning was practising on the Flanders, putting in a good morning's work. Kemp also flew same machine for some time. At the Dep. school, Petre and Sabelli both flew a circuit on the racer. At the Bristol school, Merrian was out first, testing the air, followed by Raleigh, who flew the necessary tests for his certificate in very good form. Merrian then took him for a two-circuit flight.

In the afternoon, Fleming was up with Nesham, who afterwards made a good flight of two circuits. Lane also out, rolling on the Bristol school monoplane. At the Dep. school, Petre and Sabelli flew both the racing and the *brevet* machines each for some considerable time. Hamel on Sopwith's 70-h.p. Blériot made it climb unrelentingly until about 1,500 ft. was reached in an absurdly short space of time. He then performed some circles, and came down in a very steep spiral dive, afterwards flying low around and over the sheds. Kemp and Fisher both flew the Flanders at various times, followed by Lark making short straight flights. On his landing at the conclusion of one of these a bolt holding the tracking forks in place happened to shear, causing machine to heel over on one side, digging holes in the earth for some distance with the end of the right wing and the warp pulley cabane respectively. Another testimony to the strong wing-construction of the Flanders machine, for, to everyone's surprise, nothing had given way except one wheel-base wire. On replacing the defaulting bolt, machine was run back to the shed under her own power.

On Monday morning Fleming was testing the Bristol monoplane, followed by Lane, who did some rolling. Fleming also took Lang



Lieut. Hynes at Salisbury Plain, just about to start on a Breguet machine in connection with the Army work. Lieut. Hynes is, we believe, the first Englishman to fly a Breguet in this country.

as passenger, to test a propeller, and then accompanied Merrian, who took him as passenger for a flight at 600 ft., the ex-pupil reflecting credit on his erstwhile instructor. Duigan was tuning-up the Nieuport-chassis Avro biplane, rolling, and making short straight flights. Ducrocq was out for about 20 mins. across country over Chertsey. In the absence of Kemp, Fisher acted as head-pilot-instructor of the Flanders school, going for a good flight on the monoplane. Lark and Manning then made some straight flights. Flying then stopped while "Partridge" took his *brevet*, which he did very well indeed, flying steadily at about 300 ft. Sabelli also flew circuits on the racer.

On Tuesday Fleming was testing the Bristol monoplane in straight flights. Lane also made some short straights on same machine, and is improving. Lang went as passenger both with Fleming and with Merrian. Fleming then took Lark for a passenger trip. Gill flying straights on the *brevet* Deperdussin had the misfortune to break both ends of his propeller on landing, but was doing well later when this was changed. Kemp and Fisher flew circuits, while Manning and Lark made straights on the Flanders. Major Bannerman also making straights on the Bristol, while Pashley did the same on the Humber-Blériot.

Eastbourne Aerodrome.

ON Thursday last week the weather being more favourable, Lieut. Lawrence decided to start for Dover. However, fates were against him, as although the engine started at the first swing, it only ran for about half a minute and then petered out. Everything was gone through and found in perfect order, but beyond a few feeble explosions, nothing resulted. The magneto was tested and gave an excellent spark. After taking out the inlet valves, and cleaning them, no better result was obtained, so as a last resource it was decided to try another magneto. This resulted in solving the mystery, the engine starting up first pull. Unfortunately, by this time it was too late for him to get off, so the attempt had to be given up. On Saturday some useful school work was put in, the afternoon being particularly fine.

On Sunday afternoon, Lieut. Lawrence turned up and took his Blackburn out, but the engine seemed to have no pull in it and it was only with difficulty that he managed to keep the machine up at all. There is no doubt that he handles the machine well, his landing being graceful. On Monday the Blackburn was again out, but although a good deal of time had been spent on the engine, it did not give any better results. Messrs. Gassler, Yates and Fowler were all out putting in some good work. During one of Mr. Fowler's flights his petrol pipe broke, necessitating a *vol plané*. Luckily he was not far away and just managed to get back into the aerodrome. Lieut. Lawrence has decided to have his engine taken right down, and has handed it over to the E.A.C.'s mechanics.

London Aerodrome, Collindale Avenue, Hendon.

Grahame-White School.—The weather during the early part of last week was exceptionally trying, although all the pupils were well employed in the workshops both in theoretical and practical work. Most of Thursday was boisterous, the wind abating during the afternoon, Lewis Turner had Biplane No. 2 out for many circuits remaining for three quarters of an hour in a fairly moderate breeze. Biard was also up for half an hour doing circuits on Biplane No. 3, the wind suddenly increasing he was unable to continue.

Friday saw the arrival from America of the two-seater Nieuport upon which Mr. Grahame-White had so much success and broke so many records in that country; and although the weather was too boisterous all day for flying, the pupils were greatly interested in assisting the mechanics to assemble it. Lieut. Parke was a visitor to the school during the afternoon and inspected the new Grahame-White biplane.

Weather was boisterous all Saturday and too rough altogether for the pupils, but Mr. Claude Grahame-White was out on the new Grahame-White biplane for its first test but the controls working stiffly and the wind being at some 20 miles an hour, after a circuit he had to descend; the oil gauge glass being smashed; with some minor alterations, however, the machine should put up some good flights.

Sunday opened fine with hardly any wind whatever, and Lewis Turner was out very early on Biplane No. 2 making circuits, but had to descend owing to the engine running badly; after some slight adjustments, however, he was soon up again with a passenger who made some very interesting sketches of the aerodrome and surrounding country from a height of 750 feet; later, up again with another passenger getting to an altitude of 1,000 feet, and, finding the engine running well, made an extended tour of the surrounding country; after a rest, up again with more passengers, one of whom took many photographs whilst in the air. Mr. Biard also out on Biplane No. 3, doing excellent circuits at a height of about 150 feet. Mr. Manton was also up with Mr. Turner as passenger, he being a new pupil and his first experience in the air. In the afternoon a great deal of flying was witnessed, Mr. Grahame-White taking up Master Stanley Lewin for an extended flight on Biplane No. 2, after which the 70-h.p. Nieuport was brought out from its hangar and flown for the first time in England. After giving the machine a thorough test, and landing with a beautiful glide from 500 feet, Mr. Grahame-White took up his chief mechanic and started for Brooklands. Rising to the height of 500 feet in a half circuit of the aerodrome he was quickly lost to view in the direction of Ealing, but after an absence of ten minutes he was forced to return to the aerodrome, having run into a very dense bank of fog somewhere over Acton. After giving a magnificent exhibition of banking, he finished up his flight with a very fine glide into the centre of the aerodrome.

Monday was a nice bright day, but wind very gusty; Lewis Turner was up on Biplane No. 2 for a quarter of an hour's spell, quickly followed by Fowler on the same machine, who did 20 minutes' circuits at a height of 100 feet, finishing with an excellent spiral. Biard out on Biplane No. 3 for a quarter of an hour, Manton also out rolling on Biplane No. 4, making some excellent straights, increasing wind, however, causing an adjournment to the works and no further flying was indulged in during the afternoon.

A.S.L. Flying School.—Last Sunday was an ideal flying day. In the early morning Mr. Barber was very busy tuning up the "Viking" and seeing to the final adjustments ready for Captain E. B. Loraine's tuition, preparatory to his attempt for the Mortimer Singer prize.

With engine in first-rate condition Captain Loraine set out at great speed, but unfortunately omitted to follow instructions, shut off his petrol supply and was unable to regulate it accurately again, consequently the machine ran slowly over very soft ground, and the wheels stuck in a filled-up ditch, and the machine stood on its nose, only a few wires were broken and the machine strained a bit; the landing carriage and front skid standing up to their work nobly. A demonstration of how dangerous it is for pupils not to pay careful attention to their experienced instructors. By the afternoon the machine was ready for flight once more, when Mr. Barber was flying circuits in good style and also carried passengers for short flights.

Monday was again a good day, and Ridley Prentice was out early on the Green-engined Valkyrie for trial flight, before handing over this machine to Greig, the latest pupil to join the school. He put in some good rolling practice, quickly getting accustomed to the controls.

Tuesday opened calm, but very foggy, and it was not until nearly noon that it cleared off sufficiently to allow Ridley Prentice to fly the Green-Valkyrie.

Greig then took control of this machine and showed good progress, doing short hops. Later Mr. Barber flew a circuit or two on the school machine, and then brought the Valkyrie racer, and gave a few passenger flights to Mr. G. D. Ferguson.

In the afternoon Greig was busy on the school machine, and showed considerable progress, making excellent steady flights.

Mr. Barber was out on the Valkyrie passenger machine, again taking up numerous passengers, among them were Messrs. Ferguson, North and Greig and Miss Prentice. A fine solo flight was made, during which an altitude of about 1,800 feet was made, and descent made by means of a perfect spiral *vol plané*.

W. H. Ewen School.—During the past week there have been several good opportunities for school work and a great amount of practice has been got in by the pupils. On Thursday, Mr. Denys Ware greatly improved in his rolling, while Baumann and Dubois, who have shown a remarkable aptitude, each made several excellent flights. Mr. T. H. Apcar, of Eastbourne, joined the school. On Friday, all the pupils were again out doing some useful rolling and flying practice during a short spell of calm weather. The wind on Saturday was much too strong for outside work. Miss Dorothy E. Prentice joined the school, and is thus the first lady monoplanist in England. This makes the second new pupil at the school during the week. Nearly all day Sunday the weather proved to be ideal for flying, and, as usual, the pupils at the school were all hard at work. Mr. E. H. Lawford showed considerable progress on the Blériot and Dubois, Baumann and Warren were all flying with confidence, each keeping the machine noticeably steady in the air, and making good landings. Capt. Loraine, up for a day or two from Salisbury, put up a very pretty flight of 15 minutes on the Deperdussin, his banked turns and *vol plané* from 250 ft. being admirable. During the day Ewen was out on the 28 Deperdussin several times, doing cross-country in two of his flights and putting up fine exhibitions with sharp turns and sensational spiral glides. Miss Dorothy Prentice quickly learned the controls of the Blériot, and finished the school work for the day by rolling the machine back to the hangar. On Monday forenoon quite an amount of school work was got in. In the afternoon the wind sprang up somewhat and, notwithstanding that Ewen tried the air and had rather a rocky journey, Capt. Loraine soon after took over the 28 Dep. and made a splendid flight in the 10–15 mile wind which was blowing. All Tuesday morning the aerodrome

was enveloped in a thick mist, which, however, cleared up somewhat in the afternoon. The pupils got in some good practice, Miss Dorothy Prentice and Mr. Denys Ware progressing with their rolling, and Dubois, Baumann and Warren showing by their handling of the Blériot that they are well within reach of their *brevets*. Ewen and Capt. Loraine then decided to go for the first part of their Superior Brevet Tests. Starting off on the 28 Dep., however, Ewen quickly rose to over 500 feet and found the wind there rather troublesome, while it was difficult to see the ground through the mist. On descending Capt. Loraine boarded the same machine and put up a beautiful flight in which he reached an altitude of 600 feet. He went up again later and in a flight of fully half an hour at an altitude of over 500 feet, he passed over Mill Hill and flew right up the Edgware Road, and still retaining his height on returning to the aerodrome executed a beautifully well-judged *vol plané*. Between Capt. Loraine's flights Ewen made a short flight of about 20 minutes passing over Old Hendon and going out towards Finchley and finishing off with a very effective long glide from 500 feet.

Salisbury Plain.

Air Battalion.—After a spell of ten days' persistent wind and rain, the officers of the Air Battalion eagerly took advantage of the change on Wednesday of last week. Lieut. Barrington-Kennett was first out on his Nieuport monoplane, and put in an hour scouting practice, mostly at a height of 800 ft. Lieut. Reynolds was on "F 5," and after taking one or two passengers for short trips, had the propeller changed, with marked results from a climbing point of view. With a passenger on board, he was flying around Stonehenge for an hour and a half, and paid a visit to the outskirts of Salisbury. Lieut. Hynes was up for half an hour on his Breguet over Fargo and Stonehenge, while Lieut. Connor, who has now recovered from the slight injury to his arm, was piloting "F 4," but came down owing to the *remous* being troublesome. On Thursday morning the anemometer showed that a 25 mile wind was blowing, but Lieut. Barrington-Kennett took the air and flew over Netheravon. His Nieuport behaved marvellously in the rough wind and landed in good style. Towards the evening the wind dropped and this officer was again out on the Nieuport, and Lieut. Connor and Lieut. Reynolds were up on biplanes, the latter taking up several passengers. No flying was done on Friday and Saturday, but the weather was ideal for flying on Sunday and Capt. Fulton made an early start on "F 4" taking Lance-Corporal Little for a trip. Lieut. Barrington-Kennett made flights with several passengers on his Nieuport, while Lieut. Hynes took Corporal Vagg up on his Breguet. Lieut. Reynolds was also up on a biplane and his numerous flights with brief intervals occupied three hours. All these officers were again at work in the afternoon with the addition of Lieut. Connor. Flying was started early on Monday by Lieut. Reynolds on his biplane but after Lieut. Connor had made half an hour's flight rain came on and the wind increased so stopping flying work for the time. In the evening Lieut. Barrington-Kennett was flying for half an hour with a passenger on his Nieuport and passed through several rain showers. He was afterwards in the air for an hour and a half during which Lieut. Hynes was testing the Breguet. Tuesday was misty but Capt. Fulton, Lieut. Barrington-Kennett and Lieut. Reynolds each made flights.

Bristol School.—A strong wind was blowing all day Monday last week, with rain at intervals, and a thunderstorm in the afternoon, flying being impossible all day. Trial flights were made throughout Tuesday morning, but no school flying was attempted. Wednesday morning was ideal, but the wind was tricky. Jullerot was as usual testing conditions, afterwards giving tuition flights.

Very early Thursday morning Jullerot was up on No. 66, then taking Lieut. Ercole for a flight. Gordon England was also out with Lieut. Fielding for a run. Jullerot carried out a fine flight with Lieut. Antoni as his passenger. They set off for a cross-country flight, and after making a wide circuit, returned to the sheds, dropping their visiting cards on their way to the officers of the Cavalry school. Gordon England then ascended on the Bristol tractor biplane of his own design, which, by the way, brings out several new features, also having no front elevator. England flew perfectly for over half an hour, attaining and keeping good altitude, and due praise should be given to the constructors, the Bristol Co., and to their pilot-designer, Gordon England. Lieut. Brodigan, by making several solo flights, flew for well over an hour, making figures of eight with fine bankings, he showing every evidence of not only being ready to pass the tests for his certificate, but also of proving a very useful acquisition to the Army Air Battalion.

In the afternoon, after Jullerot had again tested the conditions, Gordon England ascended with Lieut. Fielding, and allowed the pupil to take charge of the controls. Lieut. Brodigan was making several solo flights, and landed perfectly in each case, and Commander Schwann started out for his first flight alone, which he carried out very successfully, making a good landing. Prier was up testing a Bristol monoplane just received from the works at Filton, but darkness caused him to descend.

Rain fell at intervals the whole of Friday, but some flying was possible during the fine moments. Jullerot was first up on No. 55, followed by Gordon England on No. 43. Harrison, one of the instructors, then ascended with Lieut. Fielding as passenger, whilst Bendall was up with Lieut. Ercole. Good solo flights were made by Commander Schwann and Lieut. Brodigan, but just as Gordon England, on the new Bristol biplane, and Jullerot, on one of the school machines, were starting out, a heavy storm of rain came on.

Work was very brisk on Saturday morning, the whole of the Bristol staff being out giving tuition flights, but no solo work was done by the pupils on account of the tricky wind.

Under fairly good conditions, an excellent day's work was done on Sunday at the Bristol schools, no fewer than sixty flights being made in the course of the day, the aggregate number of miles flown coming out at about 700. All the machines at the school were brought into use, and some exceedingly useful work was done. Solos were carried out by the following pupils in fine style: Commander Schwann (5), Lieut. Harrison (5), Lieut. Brodigan (4), Lieut. Wyness Stuart (4), Bendall (4), and Harrison (5).

Gordon England was again out on the new Bristol biplane doing great things, reaching a good height, which he maintained for upwards of half an hour, and then came to earth by means of a *vol plané* from fully 6,000 ft., with his engine completely cut off. England was also up on one of the school biplanes, giving ten tuition flights. Lieut. Bowers put in some fine work on the Bristol monoplane, his flights for the day totalling four hours. He first of all started off for a short cross-country with Commander Schwann as passenger, arriving back at the school after a flight of about three-quarters of an hour. He was away again almost immediately, this time with Lieut. Wyness Stuart as passenger, and his clever handling of the machine is evidence of the instruction meted out to the pupils at the Bristol schools. A good cross-country flight of a duration of just on an hour was also made by Lieut. Antoni, and seeing that this pupil has not been at the school more than a week his progress has been very rapid. Lieut. Reynolds was out on one of the "Bristol" monoplanes for two fine solo flights, Jullerot was also up.

The conditions still held fine on Monday, and after Jullerot had made a trial, school work started off in the usual Bristol fashion. The wind was a little too tricky for pupils' solo flying, and Jullerot was giving twelve tuition flights, Gordon England being also out for three flights with Lieuts. Fielding, Ercole and Antoni. Jullerot took Lieut. Hall of the Cavalry school for a flight, as well as two other officers from this school, all of whom are likely to become pupils. Captain Bertram Dickson was passenger to Jullerot on his next flight, after which Captain Dickson made a solo, this being his first flight since the accident he sustained at the Milan meeting in October, 1910. The nurse attending Captain Gilbert, who, it may be added is making rapid strides towards complete recovery, was taken up by Jullerot.

Lieut. Reynolds, R.E., at the pilot's seat on his Bristol two-seater monoplane.

AIR EDDIES.

ANOTHER "mystery" was thrust upon us the week before last. Altogether it savours more of a very fine and particularly successful attempt to *tirer la jambe* of a certain press agency who did the greater part of circulating the news. The story was to the effect that a Tunbridge Wells aviator—by the way I can't seem to recollect any aviator originating from Tunbridge Wells or of any experiments being held near there—was ascending in his machine when it lurched and threw him out. The machine continued its flight, and some reports say that it was last seen flying over the Weald of Kent, while others have it that the aeroplane was found lodged among pine saplings close to the Tunbridge Wells sewage farm. This latter machine had disappeared by the next day. Undoubtedly a very fine hoax. We would all like to know what really happened. Will the esteemed perpetrator kindly oblige?

• • •

The clumsiness of hangar doors in general has always been a fly in the ointment of the poor mechanic whose duty it is to fix them at the end of a tiring day's work. The chief Yeoman of the Chisel of the Grahame-White establishment must be forgiven much for the weird notions he holds as regards aeroplane design, for he has invented really the finest type of shed door that it has yet been my lot to see. Simple and inexpensive to construct, the doors can be folded back by one man in under one minute and do not impede the clear opening of the shed. One important point, from the mechanic's point of view, at any rate, is that little physical exertion is called for.

• • •

William H. Hoff, the Curtiss aviator, who was "killed" on the first day of the Oakland meeting near San Francisco, is rapidly recovering from his indisposition, and hopes to be sufficiently recovered to fly at the Boston meet in June.

• • •

The report circulated by a well-known aviator that all the flying men at Brooklands had decided to fit engines of higher horse-power to their machines, in view of the rarity of the atmosphere due to the absence of much CO_2, by reason of the Coal Strike, is, I find, unfounded.

• • •

Those who happened to be at Hendon last Sunday were indeed fortunate, for on that day Grahame-White flew for the first time in this country his 70-h.p. two-seater Nieuport monoplane, which had just arrived from the States. Evidently he did not sell the machine to a pupil of the Moisant school as some reports had it. His handling of the "'bus" is beautiful—no vertebræ-chilling stunting but piloting of the good sound order. Had it not been for the fog he would have flown over to Brooklands during the afternoon.

As it was he made quite a long cross-country trip in that direction with his chief engineer, Carr, as passenger. Lucky passenger!

• • •

Among the publications for review this week at the office comes a piece of music entitled "Off for the Honeymoon," by Charlotta Rowe, and as I am told I can perform my five-finger exercises with commendable skill, the duty of reviewing it fell on me.

It is undoubtedly a very charming little two-step, and should have some vogue, but how it applies to aviation is rather difficult to see beyond the cover design, which depicts an aviator-husband with his feminine acquisition seated on a garden seat erection on the *cellule* of a type of biplane of which I have never yet seen the like. To complete the picture, Cupid, nursing on his lap two hearts and an arrow, is comfortably installed on the front elevator. Apparently rather dangerous for him until you notice he has a little pair of wings of his own. At least the frontispiece is up-to-date.

• • •

W. H. Ewen tells me he has a very fine new Dep. at his school at Hendon. Naturally I compliment him on the increase in his stable of tuition machines, whereupon he informs me that he was not referring to a machine at all, but to his new lady pupil. Her initials are D.E.P.

• • •

Things indeed are seriously on the move in this country at last, and I hear that L. Howard-Flanders is opening up works at Richmond where all the main constructive work will be carried out. A large hall some 120 ft. by 50 ft. will be used as an erecting shop, where four or more machines if necessary could be laid down at the same time. Planing, thicknessing, and moulding machines, circular and jig saws, are being installed, while in an adjacent building is the machine shop with lathes, drilling machines, a power hack saw and the like. The drawing and general offices are above. His Brooklands depot, naturally, he will still use as a flying school and for general repairs.

• • •

Grahame-White's return from America has been the cause of increased activity at Hendon. At the present time a new passenger-carrying monoplane for military use is being put through their fine works at Hendon. The aerodrome itself will certainly be a more popular place this year than it has ever been, for weekly exhibitions of flying and open competitions are now being organised. Further, it is Grahame-White's intention to institute a college of aviation there, and arrangements are now being made for a series of lectures. These further activities from one who has done a vast amount for the cause of aviation in this country we are pleased to see, and we all wish him a continuation of the success that has been his in the past.

• • •

Illustrative of the use of the aeroplane as a speedy vehicle, it is interesting to note that, on the occasion of Salmet's flight to Paris, telegrams advising people in Paris of Salmet's departure from Hendon did not arrive at their destination until after that pilot had landed safely at Issy-les-Moulineaux.

• • •

The weather he encountered, especially on his return journey, was probably wilder than any aviator up to the present has been called upon to endure. Intending spectators at Hendon need therefore no longer put off their visits to that aerodrome for fear of disappointment at not seeing any flying owing to the bad weather, at any rate as long as Salmet is there.

"OISEAU BLEU."

⊛ ⊛ ⊛ ⊛

AERONAUTICAL SOCIETY OF GREAT BRITAIN.

OFFICIAL NOTICES AS SUPPLIED BY THE SECRETARY.

Annual General Meeting.—The annual general meeting of the Aeronautical Society will be held on Wednesday, March 27th, 1912, at 8.30 p.m., at the Royal United Service Institution, Whitehall, S.W.

Council.—In accordance with the rules, the Council shall consist of sixteen voters of which one half shall be Fellows or Associate Fellows and one half shall be members. Members of the Council are elected to serve for two years, and half retire annually. Retiring members are eligible for re-election, if re-nominated.

The retiring members of the Council are:—

Associate Fellows—Capt. A. D. Carden, R.E., T. W. K. Clarke, J. W. Dunne and J. H. Ledeboer.

Members—John Dunville, F. K. McClean, Lord Montagu of Beaulieu and Col. F. G. Stone, R.A.

The following have been nominated for election:—

Associate Fellows—H. Barber, Capt. A. D. Carden, R.E., T. W. K. Clarke, J. W. Dunne, R. L. Howard Flanders, J. H. Ledeboer, Archibald R. Low and W. O. Manning.

Members.—Major B. Baden-Powell, Capt. P. W. L. Broke-Smith, R.E., Capt. C. J. Burke, Col. J. E. Capper, C.B., R.E., Lieut. R. Gregory, R.N., Lieut. G. B. Hynes, R.G.A., Lieut. A. Longmore, R.N., F. K. McClean, Lord Montagu of Beaulieu, G. F. Mort, Maj.-Gen. R. M. Ruck, Lieut.-Col. C. O. Smeaton, R.A., Capt. F. H. Sykes, Chas. C. Turner and Capt. H. F. Wood.

Council Meeting.—A meeting of the Council was held on Wednesday, March 6th, 1912, when there were present: Mr. A. E. Berriman (in the Chair), Mr. Griffith Brewer, Mr. T. W. K. Clarke, Mr. B. G. Cooper, Mr. Alec Ogilvie, Mr. F. Handley Page and Mr. B. Woodward (hon. solicitor).

Assistant Secretary.—Mr. Harry Turrill has been appointed Assistant Secretary of the Society from March 1st, 1912.

Meetings.—A general meeting will be held on Monday, April 15th, at 8.30 p.m. at the Royal Society of Arts, John Street, Adelphi, when Mr. T. W. K. Clarke will read a paper on "Automatic Stability."

Weekly meetings of an informal nature will be held at the Society's offices, 11, Adam Street, Adelphi, on Mondays, from 5 p.m. Refreshments can be obtained, and the library and current periodicals will be available for reference as usual.

The first meeting will be held on Monday, March 18th, when the subject for discussion will be "The Atmospherical Conditions at Brooklands Aerodrome."

Pilcher Memorial Fund.—This fund is to enable a memorial column to be erected at Stanford Park, the seat of Lord Braye, on the spot where the late Percy S. Pilcher met his death on September 30th, 1899. The famous pioneer was an active member of the Society, and at the time of his death a member of the Council. The Council beg to acknowledge the following subscriptions:—Amount previously acknowledged, £14 13s.; Mrs. Tidswell, £2; G. Brewer, Esq., £1 1s.; Alec Ogilvie, Esq., £1 1s.; Col. F. G. Stone, R.A., 10s.; A. E. Berriman, Esq., 5s.; Chas. C. Turner, Esq., 5s.

T. O'B. HUBBARD, Secretary.

FOREIGN AVIATION NEWS.

A Few Statistics from France.

IN his annual report M. Georges Besancon, General Secretary of the Aero Club of France, includes some very interesting statistics. During 1910, ten fatal accidents occurred in France, and as the distance covered in flight was 312,500 miles, this worked out to one death for 31,250 miles flown. In 1911 the distance flown was 1,625,000 miles, while the fatal accidents were 26, giving one death for each 62,500 miles. He reports that last year 1,350 aeroplanes were constructed in France as against 800 in the previous year. The number of passengers carried was 12,000, as against 4,800, and the time spent in the air increased from 8,300 to 30,000 hours.

Two Hours on a Maurice Farman.

AMONG some very fine flights seen at the Maurice Farman Military School at Buc on Saturday, was one by Naval Lieutenant Cayla, who was flying for over two hours above Rambouillet, &c.

New Blériot Superior Pilots.

ON Saturday Lieut. la Morlaye made a first qualifying flight for a superior military certificate by flying on a Blériot monoplane from Etampes to Beaugency on the Loire, a distance of 180 kiloms. Baron Pasquier made the second test for a special *brevet* with a flight of 150 kiloms.

Lieut. la Morlaye flew over the same course on the following day while Capt. de Goys flew over to Vincennes.

A Voisin Canard at Buc.

ON Saturday Colliex on a Voisin Canard fitted with a 70-h.p. Gnome engine flew over from Issy to Buc where trials are to be carried over the water; for which purpose the machine has been fitted with special hydroplane floats.

Good Flights at Amberieu.

TWO good performances were witnessed at the Deperdussin School at Amberieu on Sunday. Vidart after two or three rounds of the course flew off in the direction of Bourg, and covered 60 kiloms. before returning to the aerodome. The chief pilot Lacrouze made a flight of over an hour's duration, which ended by a very fine *vol plané*.

Long Flights on Astra Machines.

VERY little has been heard of the French-built Wright aeroplanes lately, but on Sunday last Gaubert at the Astra Flying Ground, Villacoublay, was flying for some time on one of them and carried several passengers above Sevres, Chaville and Billancourt. Labouret was also flying on an Astra military biplane for an hour and twenty minutes.

Tetard over Lyons.

LEAVING Loyettes Aerodrome on Monday, Tetard, of whom little has been heard lately, on a Dufour biplane passed over Lyons at a height of 600 metres and flew to Bron.

Ostend wants a Hydro-Aeroplane.

THE Aero Club of Ostend is negotiating with Paulhan with a view to getting him to take his Curtiss hydro-aeroplane there, in order to give exhibition flights over the sea, in the same way as has been done in the South of France. It is also hoped that a well-known aviator will make his headquarters at Ostend during July and August, and thus add aerial passenger flights to the attractions of that resort.

Aerial Delivery of Aeroplanes.

HAVING to deliver three of his monoplanes at Chalons Camp, Train left Villacoublay on the 7th inst. on one of them, and landed safely at his destination after a trip of an hour and forty minutes. The other machines are to be delivered in the same way by Cure and Derome respectively.

Four on a Cross-Country Trip.

TAKING three passengers on his Savary biplane, Frantz on the 7th inst. left Chartres in the direction of Orleans. He turned above Ymonville, about 35 kiloms. from Chartres, and keeping at a height of 1,000 metres he returned to his headquarters.

Maurice Farman Superior Pilots.

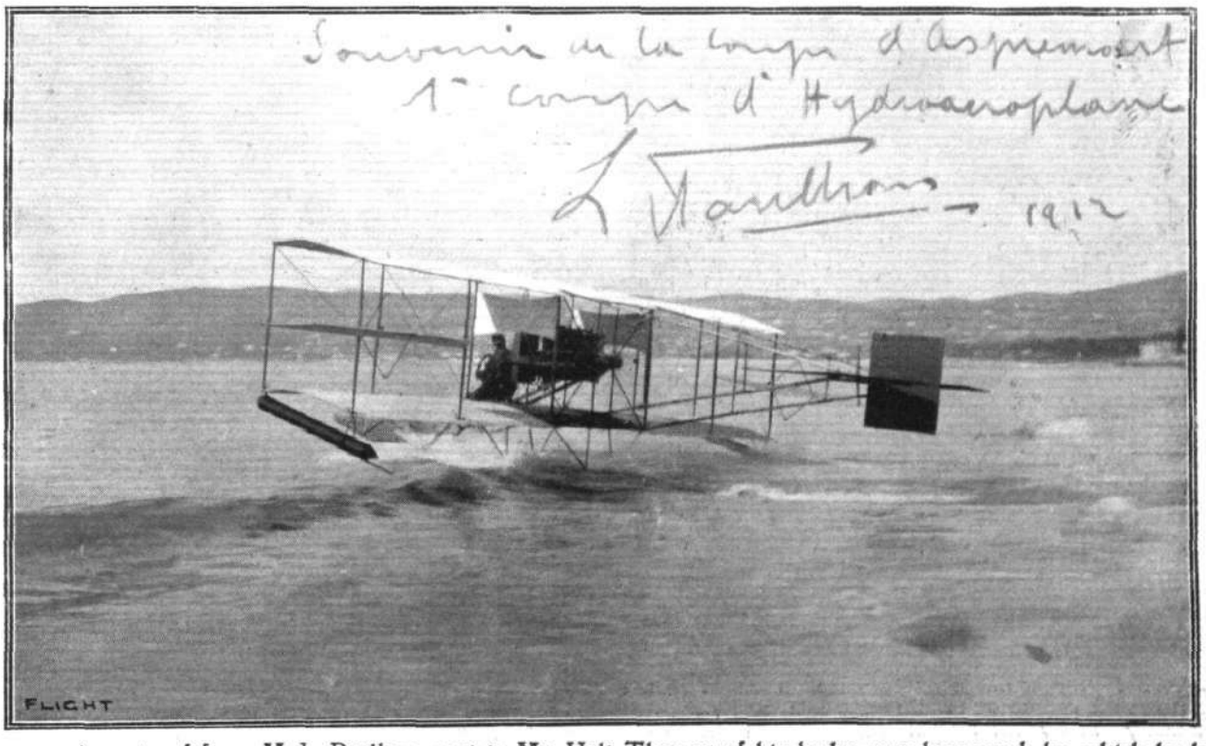
ON Saturday last Sapper Grandjean made a first flight for a French Superior certificate over a course from St. Cyr to Bouneval and back. He was mounted on a Maurice Farman biplane as also was Lieut. Vandien who made a similar flight over the same course. Each made two similar flights on subsequent days.

Long Trip on a Caudron.

FIGHTING his way against a strong wind Lieut. Peralda made a fine flight on Saturday on his Caudron biplane from Crotoy to St. Valery-en-Caux taking 2 hrs. 10 mins. for the journey of 175 kiloms.

Vedrines after Parliamentary Honours.

WHILE making some flights at Quillan near Limoux, Vedrines heard that the local representative in the Chamber of Deputies, M. Dujardin Beaumetz, had been elected to the Senate, and the aviator at once offered himself as a candidate for the vacant seat. If he is successful, M. Vedrines will be the first aviator pilot to enter the Chamber.



A souvenir postcard from M. L. Paulhan, sent to Mr. Holt Thomas, of his hydro-aeroplane work by which he has just secured the Coupé d'Aspremont.

Morane Calls on Maurice Farman.

ON his monoplane Morane on Sunday, after circling above Villacoublay, flew over to Buc and called on Mr. Maurice Farman. He afterwards flew back to Villacoublay where he put in some very fine practice flights.

A Paulhan Torpedo for Italy.

ON the 9th inst. at Rheims a Paulhan-Tatin torpedo was put through some tests previous to being delivered to Signor Bosse an Italian aviator. Piloted by Chambenoit it made four flights at heights varying from 150 to 200 metres and at a great speed, while the machine proved to be very stable.

A Caudron Hydro-Aeroplane.

AT Crotoy on the 9th inst. Rene Caudron was testing a biplane which he has fitted with Fabre floats and with which he made several flights over the Somme Bay, the machine arising and alighting on the water quite easily.

Mdlle. Herveu Practising for Coupe Femina.

UNDETERRED by her unsuccessful attempts to secure the Coupe Femina, Mdlle. Jane Herveu has been putting in some very good practice at Pau on her Blériot monoplane. On the 9th inst. she covered a distance of 205 kiloms.

Verrept makes good Cross-country Trip.

WITH Lieut. d'Abrantes on board his Borel monoplane, Verrept started up from La Vidamée, and in not particularly favourable weather made his way across to Rheims, covering the distance of 120 kiloms. in 1 hr. 5 mins.

Fatal Accident to an Aviatress.

APPARENTLY the fatal accident to Mdlle. Bernard a girl of nineteen years of age at Etampes on the 10th inst. must be put down to the pilot's inexperience, although she had been practising for some time, first at Chalons and then at Etampes. She was making her third test flight for her *brevet* and tried to make a turn when rising with the result that the biplane slipped sideways from a height of 60 metres. The aviatress sustained such injuries that she died within a few minutes without regaining consciousness.

The Ae. C. F. Grand Prix.

THE idea of having the Ae. C. F. Grand Prix race over a cross-country circuit in the Anjou district is being most enthusiastically taken up, and the Muncipal Council of Angers, which is to be the starting place has unanimously, voted a sum of £400 towards the expenses.

Mdlle. Bernard, the young aviatress who, in endeavouring to obtain her Aero Club of France certificate for flying, was unfortunately fatally injured at Etampes last week-end. Mdlle. Bernard is reported to have endeavoured to rise when making a turn.

Good Flights on a Blériot.

FOR his first qualifying flight for his French military certificate, Lieut. de Bernis on his Blériot, on the 5th inst., covered the circuit Pau, Dax, Magescq, Pau. Most of the time the pilot kept his machine at an altitude of about 1,700 metres. On the following day Lieut. Brule went to Dax and Herin, and the strength of the wind may be gathered from the fact that his time for the outward journey was 1 hour 40 mins., while coming back he only took 45 mins. for the 80 kiloms.

The National Movement in France.

THE Marquis de Dion has suggested to the Committee in charge of the National Fund for the equipment of the "Fourth Arm" of the French Army that a great lottery should be organised with a first prize of one million francs, the total prize money to be about £800,000.

Meanwhile the subscription fund is mounting up and on Saturday last it stood at about £52,000. It has been practically decided by the Minister of War that the bulk of the money shall be spent in preparing landing places and hangars at the most important points, from a strategical point of view, in the country.

The Berlin–Vienna Race.

IN view of the Austrian motor car trials, the date of the starting for the race between the German and Austrian capitals has been brought forward, and will now take place on June 9th, competitors leaving Johannisthal between 3 a.m. and 6 p.m. on that day or the following day. The entry fee has been fixed at £10, and entries may be sent in up to May 15th, or at double fees up to May 20th. The prizes will be £250, £150, and £100 for the first three to arrive at Vienna, and an additional £2,000 will be divided *pro rata*, according to the length of their flights, among those who cover more than the first stage to Breslau, while a further £1,500 will be similarly distributed among those who only compete in the first portion.

Bristol Machines in Germany.

AFTER his missionary trip to Spain, Mr. C. H. Pixton took a Bristol two-seater military monoplane to Berlin, and demonstrated it before General Baron Von Linckner, General Messing, and Staff Officers of the German Aviation Corps, on the 5th inst. at Johannisthal. Several officers were taken as passengers, and on the previous day Mr. Pixton carried an officer of the German Aviation Corps for a long cross-country flight, being up for just over an hour, during which a fifteen-mile wind was blowing.

Cross-Country Flying in Germany.

LEAVING Johannisthal at 7.35 a.m. on Saturday last with the intention of flying to Hamburg on his Sommer monoplane Buchstetter was forced to land at Wittenberg at 10 o'clock. He re-started at 3 p.m. and reached Hamburg safely at half past six.

A German Passenger Record.

AT Johannisthal on the 8th inst., Hoffman on a monoplane made a new German passenger record carrying four persons besides himself on the machine for 32 mins. 35 secs. and beating Renzel's record of 21 mins. 45 secs.

A Russian Mission in Germany.

A NUMBER of Russian military officers visited the Johannisthal Aerodrome on the 8th inst., and exhibited great interest in the schools there. They were specially attracted by the new fast Rumpler machine which is fitted with two 100-h.p. motors and with which Hirth has been making some very rapid flights recently.

Bristol Aeroplanes for Spain.

As a result of the visit of Messrs. Busteed and Pixton, with their Bristol monoplanes, to Spain, the Spanish War Office have placed a large order for both monoplanes and biplanes with the British and Colonial Aeroplane Co., and the firm has also been requested to take over the control of the Spanish School of Military Aviation with complete charge of the training of the military pilots on Bristol machines.

Flying Across the Sahara.

LIEUTS. DE LAFARGUE and Reimbert are steadily practising at Biskra, in view of their contemplated flight to Touggourt, a distance 250 kilometres. As it is practically impossible for the aviators to be followed by motor cars they will make the journey in company, each carrying a mechanic and a few spare parts on their areoplanes. It is proposed to make one stop at M'Raïer, about 112 kiloms. from Biskra.

Models

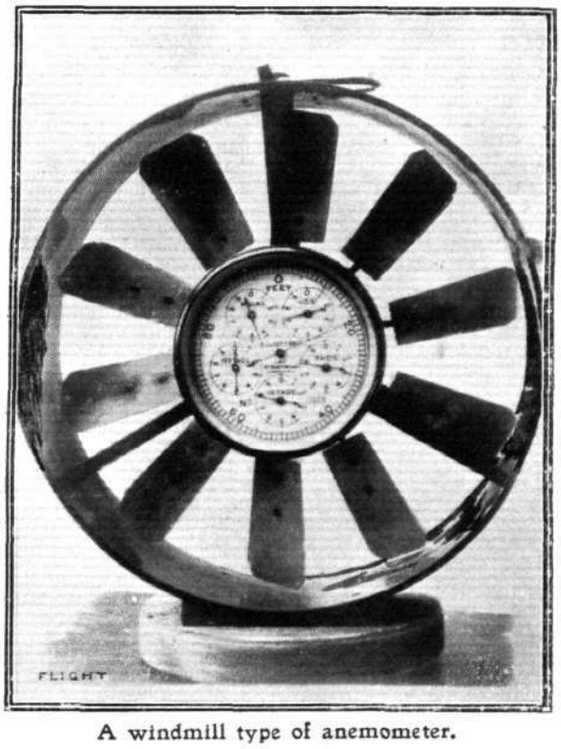
Conducted by V. E. JOHNSON, M.A.

Wind Measurement or Anemometry.

BEFORE any proper comparison can be made between different distance records, it is essential that the wind velocity be known, and that as far as possible a proper allowance be made for it. A perfect instrument for measuring either the direction or velocity of the wind should be without weight and friction; such being impossible, we must evolve the instrument most likely to conform approximately to these requisites. Lightness, strength, an absence of friction (as far as possible) and of liability to be affected by meteorological changes other than those for which the instrument is designed having been, we will presume, achieved; the next question is to determine the relation that exists between the indications of the anemometer and the wind. This is a task of no mean difficulty. A method commonly employed for calibrating a velocity anemometer is to mount it on the arm of a whirling machine and move it through still air at a known rate, and compare the indications of the instrument with this rate. But for the air to be "still" means, in practice, that the experiment must be carried out indoors and in a closed room where the continual rotation of the turning arm soon sets up a rotational movement of the air surrounding it, the effect of which it is very difficult to properly allow for. If the experiment be made out of doors really calm days are seldom obtained anywhere, and if the day be not calm the effect of the natural wind seriously impairs the result. The wind tunnel cannot be used unless we know the velocity of the wind through it, and how are we to know that before we have an instrument to measure it?

However, as the result of a number of experiments extending over many years, we probably have now fairly accurate instruments, obtained by a careful comparison of the various results arrived at, due weight being given to the varied conditions under which the experiments were carried out. When using a whirling table a source of error which must be allowed for is the effect of the centrifugal force on the bearings of the anemometer if the rotation of speed be high.

In the well-known Robinson cup type of anemometer it is obvious that there will be considerable back pressure—originally the cups



A windmill type of anemometer.

were supposed to revolve at one-third the wind velocity, irrespective of the size of the cups or their distance from the centre, but more recent experiments have shown that neither the ratio one-third nor any other will apply to all sizes of the instrument. As a rule a larger instrument registers higher than a smaller. Instruments fitted with large cups compared with the length of the arms register higher at low velocities and lower at high velocities than those having relatively smaller cups and longer arms, because the larger cups of the more compact anemometer shelter one another at certain points during their rotation. Dines found that the factor for the old Kew pattern should be 2·10; and when the distance of the centre of the cups from the centre of the axle is 24 ins., and the diameter of the cups 9 ins., 2·2 is probably the most correct (average) factor. In any record taken by means of such an instrument the following facts should be stated: (1) length of arm (axis to centre of cup): (2) diameter; (3) how the registration is effected, mechanically, electrically, &c.; (4) name of maker; (5) height above the surface of the ground.

Another form of rotational anemometer (illustrated) is the windmill or fan type, and which is or should be *kept normal to the wind by means of a vane*. In general practice with this and similar forms of anemometers—only one vane is used—which rotates about a vertical axis, the general supposition being that the wind blows *horizontally*, which, as a matter of fact, is by no means the case, and the anemometer is not kept truly normal to the wind; to do this a form of universal joint would be necessary.

In the illustration (an instrument built by Messrs. Elliot Bros., and owned by Mr. T. W. K. Clarke), the diameter of the fan wheel has been so calculated (suppose) as to allow a foot of wind to pass every revolution—this ratio being verified on a whirling table. What an anemometer of this type does is to make a direct measurement of the quantity of wind passing through the instrument in a given time, and it is necessary to use a stop-watch at the same time in order that the reading of the anemometer be converted into velocity, say, 200 ft. in 30 secs., or so many miles per hour. When we wish to ascertain the wind velocity with such an instrument, the casing is placed back to wind, so that the dial faces the observer, and the wind-vanes are allowed to rotate for a second or so, so as to get up speed. The lever seen at the top is then pulled to the left, and the large pointer on the dial commences to rotate, registering 100 ft. every revolution, the five smaller dials registering hundreds, thousands, tens of thousands, hundreds of thousands, and millions respectively. The instrument can be reset to zero by turning it to face the wind and allowing it to run back. This is, however, unnecessary if the position of the hands on the smaller dials be noted before each experiment. Instruments of this character are now constructed which can be reset and which are also self-timing.

When used in competitions these anemometers should be mounted on a vertical pivot fitted with a wind-vane and should be placed at a minimum distance of seven feet from the ground—nine feet is still better. It is most important that they should be so mounted and provided with a wind-vane, because if the wind impinge on them at an angle, not only do they fail to register correctly, *but can quite easily be made to turn in the opposite direction*, as a few experiments soon show.

Having taken the number of feet of air passed through as registered by the anemometer, there still remains to apply the correction chart, which each should possess, and to add or deduct the necessary amount of air in feet.

For instance, in the anemometer we are referring to, suppose the velocity was 200 ft. per minute, then we must add 16 ft., *i.e.*, 8 ft. per 100 ft. Again, suppose the velocity was 525 ft., then it is correct, and above 525 there is a very small increasing deduction to be made.

Other well-known form of anemometers are of the pressure type—these we must leave over for future consideration.

Notes.

Wind Velocity and K. and M.A.A. Records.—To accurately allow for wind velocity in the case of a model travelling, say, north to south, but circling in so doing, is obviously impossible, and the decision which the Kite and Model Aeroplane Association have come to in the matter is that the model must be launched and flown *with the wind*. The wind velocity in every case as registered by the anemometer (and corrected) *to be deducted*.

If the model fails to fly with the wind flying, say, across it, the deduction is still made, and not only so, but even if the model were to veer round and fly into the wind. It is an essential qualification therefore for a good record that the model should fly *straight*.

The Weight of Gold-beater's Skin.

Mr. Ernest A. Vessey writes, *re* our remarks in last week's issue on the above :—" I should like to say in self defence that my information as to the weight of gold-beater's skin was taken from the list of Messrs. T. W. K. Clarke and Co., of Kingston-on-Thames, a copy of which I enclose." We have referred the matter to Mr. Clarke, who in his reply states that he has weighed $4\frac{1}{2}$ sq. ft. of the single skin, and found it to weigh $4\frac{1}{2}$ drams, which works out at $\frac{9}{16}$ oz. per sq. yd.

We have re-weighed a square foot in our possession, and found it to weigh exactly $\frac{1}{16}$ of an oz., so either Mr. Clarke is so fortunate as to have possession of an exceptionally light material or we are so unfortunate as to be in possession of the opposite.

We might just mention (as the fact does not appear to be very generally known) that what is called gold-beater's skin is a thin tough membrane prepared from the external coat of the cœcum, a part of the large intestine of an ox. It is drawn off in lengths of about 25 inches from the other membranes. One of its uses is to separate the leaves of gold during the process of gold-beating, hence its name.

Referring to his omission of any allowance for jointing, Mr. Vessey argues thus : " Joints have to be made in the fabric of a full-sized machine, and although the number of joints in the model will undoubtedly be more numerous (largest size gold-beater's skins run about 25 ins. by 14 ins.), the weight of each joint will be proportionately less than the full size one on account of its being made with adhesive instead of being sewn. The saving in weight on each joint in the model may, I think, in the aggregate be safely taken to compensate for the greater number of joints."

Mr. E. Trykle's Duration Record.—Mr. E. Haddon Wood writes in reference to Mr. E. Trykle's 92–95 seconds' duration, that the latter record has been made since his letter was sent in (the record flight of 95 secs. being made January 10th, 1912) his previous record being 92 secs. [This is quite correct.]

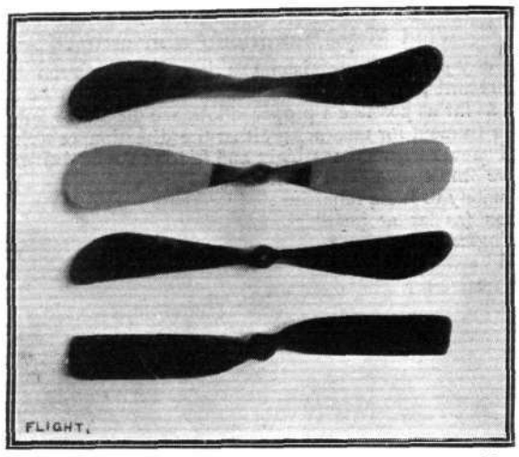
Model Aero Club Wanted.

R. REGIS (10, Berestede Road, Hammersmith) would be glad to know if there is a model club in or near Hammersmith or Chiswick ; also he would like to get in touch with anyone interested in models in that neighbourhood, as he has seen some very good models about.

Messrs. J. Bonn and Co.'s Propellers.

We give this week an illustration of four propellers kindly supplied us by this well-known firm for testing purposes in connection with the steam plant for models (referred to in February 10th issue), with which we hope to begin experimenting in another week. We shall have more to say on this subject later.

Apart from their propellers this firm also makes a speciality of brackets, sockets, lugs, wheels, aluminium sheeting, tubing and all kinds of geared wheels and small as well as large etceteras, which



Set of four propellers, standard types, diameter 16 inches constructed by Messrs. J. Bonn and Co.

are so essential to successful model building. Their aluminium wheels struck us as especially well designed, and we are by no means partial to aluminium generally speaking.

The propeller types (reading upwards) are Normale, Chauvière, Bonn, Centrale.

Replies in Brief.

PEARON L. ADDISON.—Your interesting communication to hand ; also sketch of flying ground, which we are placing by for future reference. In reply to your query at the end of your letter—we do not know of one.

⊛ ⊛ ⊛ ⊛

THE KITE AND MODEL AEROPLANE ASSOCIATION.

OFFICIAL NOTICES.

Council Meeting.—A meeting of the Council was held on Thursday, March 7th, when there were present : Col. J. D. Fullerton, R.E., in the chair, Mr. R. M. Balston, Mr. T. O'B. Hubbard, Mr. C. R. Fairey, Mr. V. E. Johnson, M.A., Mr. G. Rowlands, Mr. G. P. Bragg-Smith, Mr. E. W. Twining, and W. H. Akehurst, hon. sec.

Registration of Model Aeroplane Performances. — The invitation of the Paddington and Districts Ae.C. to hold the next trials on their ground at Parkside, Sudbury, was accepted with thanks, the date fixed being Saturday, April 13th, at 3 p.m. The Council will be pleased to entertain applications from other London clubs who would like the official trials to be held in their district on suitable grounds.

The Royal Aero Club's Competition.—The rules, as drawn up by the rules committee, were confirmed, and the hon. sec. was instructed to forward to the R.A.C. for their approval.

St. Quintin's Park Horticultural Society's invitation that the Association should hold an evening competition on the day of their third annual show, on Thursday, July 18th, was accepted, and the rules drawn up by the rules committee for an altitude competition were allotted for this date ; the hon. sec. was instructed to forward a draft copy of same to the society, and to convey the thanks of the council for their invitation.

Deputation to meet Wimbledon Common Conservators.—The Council appointed a deputation to meet the Conservators at their next meeting, on April 1st, at 5 p.m., at Lincoln's Inn Fields, for the purpose of obtaining permission for man-lifting kites to be flown on the Common, also for model aeroplanes to be flown, as it is important to have this work done for scientific purposes as well as for sport.

W. H. AKEHURST, Hon. Sec.

⊛ ⊛ ⊛ ⊛

PROGRESS OF FLIGHT ABOUT THE COUNTRY.

NOTE.—Addresses, temporary or permanent, follow in each case the names of the clubs, where communications of our readers can be addressed direct to the Secretary. We would ask Club Secretaries in future to see that the notes regarding their Clubs reach the Editor of FLIGHT, 44, St. Martin's Lane, London, W.C., by first post Tuesday at latest.

MODEL CLUBS.

Aero-Models Assoc. (N. Branch) (Sec., MALCOLM B. ROSS 15, HIGHGATE AVENUE, N.).

On Saturday, Corder's mono. made very steady flying for 310 yds. This model has two rear fins. Hindsley got no more than 190 yds. Root, Partridge, King, Ross, Pidsley and others also flying.

To-day, Saturday, at Bishop's Avenue, East Finchley, open distance event for " Mann." Set of parts offered by that firm.

Birmingham Aero Club (Secs., R. COBHAM, G. H. WOOD, 8, FREDERICK ROAD, EDGBASTON).

MR. G. HADDON WOOD on Monday week gave an interesting lecture on " Gliding."

The club is organising a team of model flyers to fly against other clubs about the country, London included.

Good flying last week-end on Billesley Farm by Mr. E. Trykle and Mr. G. Wilde. A dozen flights in succession by Mr. Trykle, all over 60 secs. duration, best $85\frac{2}{5}$, 88, 85 secs. respectively. Mr. G. Wilde's " Trykle "-type model rose to a height of 120 ft., duration $64\frac{4}{5}$, 67 and $65\frac{1}{5}$ secs. Mr. Rogers with a small " Trykle" model scored $40\frac{3}{5}$ secs. Mr. W. Lunn, 40 secs. Messrs. M. Vale, V. L. Thompson, W. V. Jones, G. Baker, G. Haddon Wood also flying very well. All flights timed with stop watch by secretary. Models, except Messrs Jones and Wood's, were single propeller models.

Blackheath Aero Club (Hon. Sec., A. E. WOOLLARD, 48, HAFTON ROAD, CATFORD, S.E.).

FLYING at Club's aerodromes last week-end as follows:—At Kidbrook, Mr. Slatter did excellent work with two "A-frame" models; Mr. A. B. Clark flew his 2¼-oz. Victor, and a 5-oz. "A-frame," which carried off the distance honours for the afternoon; Mr. J. H. Dollittle was flying a 2½-oz. "Gnat" single-stick monoplane, with floating tail. There were also present with models, Messrs. Brown, Williams, Hoch, Pizey, Egelstaff, Peter, and Holland. At Grove Park, Mr. A. E. Woollard was flying a single-stick monoplane. At Lee, the interest that the public take in the Club's work was made manifest by the large number of motor cars and cycles that lined the side of the ground at Lee. The spectators were well rewarded for their interest, Messrs. Conolly and Coomber scored with their biplanes for duration and stability. Mr. Plummer's machine flew at great altitudes; Messrs. Dollittle's "Gnat" flew right out of the ground, and Trask obtained excellent flights. There were also present with flying models, Messrs. Brough, Peter, Hinchcliffe, Richards, Bailey, F. and A. Jarvis. At Crofton Park, Mr. A. B. Clark obtained flights of over 250 yards, with the "self-rising" model illustrated in FLIGHT a few weeks back, Messrs. Hoch and Peters were very keen rivals at this ground.

The "Point-to-point" competition was postponed for a few weeks. Members are reminded of the W.H.C. competition now being held during the week-ends, full particulars of which appeared in FLIGHT last week.

Brighton and District Model Ae.C. (Hon. Sec. A. VON WICHMANN, "KINGSLEIGH," KINGSWAY, HOVE.)

GOOD afternoon's work at Shoreham on 9th. Bate continually outside aerodrome, from hangars. More than quarter-mile to boundary ditch. Competition for Mr. Townsend's prize (members only) open till after Easter. Members are reminded that prizes are to be flown for on duration-loading formula. Flying to-day (16th) at Shoreham.

Cardiff Aero Club (114, MISKIN STREET, CATHAYS).

THE club has had great success with a Brookite kite, which has been flown in the evenings with a light attached to it and in the day time with a banner with the club's name on it. The members are busy making models for the coming exhibition, which will most likely take place on April 17th, followed by a whist drive, which will be held at the White Hall Rooms.

Will aeroplane companies send their catalogues to the club.

Coventry Aeroplane Building Society (Sec., J. W. SCHOFIELD, 22, KINGSTON ROAD, EARLSDON).

THE Birmingham Aero Club have decided to pay a return visit to Coventry on Easter Monday with a team of model flyers. A reminder *re* the Exhibition in Corn Exchange, March 30th. To be opened by the Mayor of Coventry. A silver medal, value 10*s*., is offered by Mr. W. A. Weaver, and also three certificates, for best model shown by amateur (not member of the above Society) for design and workmanship. Entrance fee, 1*s*.; entries close March 16th. All models to be sent to Morton and Weaver, Cox Street, Coventry, to be judged, on March 23rd. Goods and models for show to same address.

Dover and District Model Ae.C. (Sec., H. D. DAVIS, "OAKVILLE," GODWYNE ROAD, DOVER.)

TWO competitions were held on Saturday, viz., landing nearest a given spot, also altitude and best *vol plané*. Whorwell came first in the former and Holman in the latter. Other good results were obtained by E. N. Joyce, C. V. Thompson, H. D. Davis, A. C. Wilson, and J. Clark. There were about 16 model aeroplanes on the ground. E. N. Joyce's single-screw racing monoplane made some fine trips. The machine, which is about 3 ft. long, main plane 2 ft. span, with the elevator made of wood, is a swift and steady flyer. Best flight of the day by H. Holman's monoplane, which showed great stability, speed in rising, and good *vol planés*. Remaining contests to-day (Saturday).

Ealing and District Ae.C. (Sec., B. J. KIRCHNER, 1, QUEEN'S GARDENS, EALING, W.)

ON the 9th inst., Mr. L. Roche, with his 3-oz. monoplane, flew 759 ft., and had durations of 30, 32, 35 and 33 secs. Mr. C. Chilcott's model, with a novel plane, made 620 ft. Mr. R. Hall's new model gave good promise; best duration, 26 secs. Mr. C. Davies' beautifully-finished model (0-1-1-2P), with a plane embodying several good theories held by owner, was very speedy. J. Pratt, C. Roche, G. Beeching and L. Kirchner were flying well. Mr. F. Pratt, a new member, was enrolled.

On the 10th, Messrs. L. Roche, R. Hall, C. Chilcott, J. Pratt, C. Roche and C. Davies obtained good and consistent flights. Mr. L. Roche's best duration, 31 seconds. C. Roche flew a "Baby" monoplane with Butterfly planes. Mr. Davies, with his new speedy model, had best duration of afternoon—32½ seconds. R. Hall J. Pratt, G. Beeching and L. Kirchner also had good flights. Saturday, eliminating trials for Paddington Aero Club contest. Meeting, at 8 p.m., at club room (40, Pittshanger Lane, Ealing), on 20th inst. (Wednesday). Members please note change of address.

Contest with the Aero-Models Association (N. Branch) for duration has been arranged. Date later.

Hackney and District Aero Club (Sec., B. H. LONGSTAFFE, 47, JENNER ROAD, STOKE NEWINGTON, N.)

MODEL work on Saturday was very instructive. Mr. Hall's model gave very good idea of the effect of flexible wings. Messrs. Gittus and Marmin greatly improved in duration. Louch with 8¾-oz. model gave 50 secs. duration and well over ¼ mile distance.

General meeting 22nd March, at Speasley Hall, opposite Fire Station, Brooke Road, N. 7.30 sharp.

Paddington and Districts Aero Club. (Sec., W. EVANS, 133, BUCHANAN GARDENS, HARLESDEN).

LAST Saturday reception and address by president, Mr. V. E. Johnson, M.A. There was a large attendance of members, and a fine exhibition of both scale and flying models. After inspecting the models the president spoke on the prospects and probable future of model aeroplaning. He advocated the use of fair sized models, small ones being looked upon by the public as toys and not tending to raise the science of model aeroplaning to its proper level. He thought inter-club and, if possible, international model contests would prove invaluable. He also favoured the idea of a governing body to embrace all model clubs so that they may all work under

Members of the Ealing and District Aero Club at their meeting last Saturday, amongst the group being Messrs. R. Hall, L. Roche, C. Davies, and C. Chilcott.

the same rules. Concluding, the president offered a prize for a club competition to be held about September for tractor monoplanes or biplanes rising off ground. New members enrolled Messrs. Cole, Collins and Dibbern.

Saturday, March 16th, duration trials for selecting team for Ealing inter-club contest. Members may also fly for club certificates from now onwards; rules *re* same posted in workshop. Lecture same evening on propellers, how to find pitch, &c. Members attending will be presented with a lithographed table of propeller pitches.

Reigate, Redhill and District Aero Club (Sec., H. V. MAY, 4, LONDON ROAD, REIGATE).

ON Wednesday, Messrs. Norton, Lewis, Osborne, and Cox out with machines. Mr. Cox obtained flights of over 200 yards with new model. On Saturday, Messrs. R. Wilson, May, Lewis, and Norton out. Wilson got good flights, across wind, with monoplane, of 250 to 275 yards, and from 200 to 250 yards with biplane. May's new 4-oz. machine got into the branches of a tree when it had covered 350 yards straight flight.

Flying, Earlswood ground on Saturday (to-day) at 2 o'clock.

St. Mary's Model Aero Club (Sec., H. W. A. JOHNSON, THE VICARAGE, KINGSTON, PORTSMOUTH).

Saturday last the monthly competition. The test was a point-to-point contest of about 120 yards by 80 yards rectangle. Results as follows: 1st, B. Restall; 2nd, H. Harper; 3rd, E. Eburne.

The club will hold an open competition shortly.

Salisbury Aero Club (Sec., E. M. LEAR, 41, ST. MARK'S ROAD).

AT general meeting on March 5th, E. M. Lear, was elected secretary in place of G. J. Robinson, resigned owing to pressure of other business. February Aggregate Distance Competition won by H. Sperring; distance, 4,148 ft., obtained in 14 flights. On February 21st, Besent passed for his second-class certificate, with a flight of 732 ft., in the presence of Messrs. Dickenson and Jennings. On Wednesday, last week, Sperring and Besent obtained good flights. On Saturday, Sperring's "rise-from-the-ground" tractor monoplane got off and flew 152 ft.; with his "Mann"-type model he got 300 and 600 ft.

Scottish Ae.S. Model Aero Club (6, MCLELLAN STREET, GOVAN).

IN the Institute, on Friday last week, Mr. P. S. MacDuft delivered an interesting lecture on "The Action of Air in relation to Rotating Planes." With the aid of an electric fan Mr. MacDuff carried out numerous experiments, some of which gave rise to much discussion by the members.

On Saturday a hydro-aeroplane meeting was held at Whiteinch Park before a great crowd of spectators.

Mr. Arthur's model was in fine form and got off every time. Mr. Donaldson's model made some hops and showed terrific speed on the water. Mr. Balden did not do so well as usual, owing to float and propeller trouble. It should be noted that Mr. Balden's machine usually rises in 10 ft., and not in 10 secs. as stated in last week's issue. Another meeting of this sort will be held soon.

Members will meet in the Institute of Ship Builders and Engineers, Elmbank Crescent, Glasgow, on Friday evenings, when discussions on matters of aviation will take place.

The third competition for the aggregate prize, to-day (Saturday), at Barrhead Aerodrome. Events, distance, and duration. Members who are not competing will find plenty to interest them at Barrhead. The Committee desire to thank those dealers who have been kind enough to send catalogues.

Worcester Model Aero Club (Sec., S. A. SEARS, VICTORIA INSTITUTE, WORCESTER).

ON the 9th ten models out, comprising six "Mann"-type models, three single propeller tail-first models, and one tractor model. Mr. F. Smith's model showed great stability considering the wind.

The committee are arranging a special competition for Easter, when it is hoped that members of the Birmingham Aero Club will visit Worcester and help to make the meeting a success. Further particulars later. Meeting to-day (Saturday), on Pitchcroft, at 3 o'clock.

CORRESPONDENCE

*** *The name and address of the writer (not necessarily for publication)* MUST *in all cases accompany letters intended for insertion, or containing queries.*

Correspondents communicating with regard to letters which have appeared in FLIGHT, would much facilitate ready reference by quoting the number of each letter.

Human Flight.

[1508] On page 123 of FLIGHT, a prize of 10,000 francs is announced for accomplishing the above. It may interest many to know that in *Notes and Queries*, September 26th, 1908, page 250, reference is made to an article published in the *London Journal* describing a manual flight by a Mr. D'Arville, in November or December, 1851, over the Champ de Mars, Paris, in the presence of a distinguished company, whose names are given. It is stated to be on page 222 of *London Journal*, but does not mention the year. Apparently, it would be November or December, 1851, or early in 1852.

Perhaps, some of your readers in London might gain access to a file of the above-named journal, and an attempt might be made to investigate the matter.

It is rather a singular coincidence that the prize should be offered from the very place where the flight is alleged to have taken place 60 years ago.

Prestwich Park. JOSEPH CLARKSON.

Ergaer and Bird Flight.

[1509] I trust you will permit me to reply to "D.T.'s" letter 1497. "D.T." states that I contend "most aeroplanes 'fly' by reason of their planes deflecting a certain mass of air downwards and thus by reaction obtaining support." What I said was the exact contrary. I said that apparently it was the impression (not my impression) "that in order to rise, the aeroplane must be inclined upwards in the direction of motion, and that the curve must be continually pushing the air down at a certain velocity."

I would define "soaring" as the art of progressing and rising in the air without (in the case of birds) expending physical effort in flapping, and in the case of machines on the lines of the aeroplane of to-day, without expending mechanical power to propel with propellers in the direction of motion.

The Wright Bros., I believe, obtained their initial air speed when soaring by being held in the teeth of a strong wind, and they were successful in soaring in this wind which undoubtedly from all accounts had an upward trend. They will, no doubt, yet do very much better. GEORGE L. O. DAVIDSON.

Amerden Bank, Taplow.

Longitudinal Stability.

[1510] I am afraid I cannot understand Mr. FitzGerald's [1496] reasoning. He seems to me to argue that, when an aeroplane is not tilted, the lift on the two planes should be equal, in order that the travel of the c.p. should be a maximum. If this is so, his logic strikes me as somewhat unsound. Further, I do not see how the case in which there is no tilt affects the problem of the prevention of longitudinal instability, which, I take it, is the problem of returning the aeroplane to its flying position, when once it has moved out of it.

Mr. FitzGerald has somewhat misunderstood my meaning, I think. The question is not, given the angles of attack and the ratio κ, to find the angle of tilt; but, given the angles of attack, κ and θ, to find the travel of the c.p., which is, I think Mr. FitzGerald will allow, a determining factor in the prevention of longitudinal instability.

Let us take a concrete example—Mr. FitzGerald's—in which $\sin\alpha=\frac{1}{10}$, $\sin\beta=\frac{1}{8}$; and let us give a value—say, 3°—to θ. Then, when $\kappa=\frac{1}{6}$, the ratio of the travel of the resultant c.p. to the distances between the c.p.'s of the planes, $\frac{t}{x}$, equals ·00998. When $\kappa=6$, $\frac{t}{x}=$ ·00757; so that the "tail-in-front" machine has a decided advantage.

Mr. FitzGerald mentions indirectly the condition for stability—that κ must not be greater than $\sqrt{\frac{376}{\rho}}$. Where κ is the radius of gyration about an axis through the centre of gravity, in metres, ρ is the weight in kilogrammes and 6 is the width in metres. These two conditions are absolutely distinct, and must no more be muddled-up, as Mr. FitzGerald says, than the analogous conditions in a ship.

O. D. ATKINSON.

"Ergaer."

[1511] I have read with great interest Dr. Hankin's notes, remarks and deductions relative to the flight of birds, and I resent the somewhat sarcastic remarks of the *Manchester Guardian* in respect to his views on "soarability" or soaring flight.

I have recently been carrying out experiments with a machine that, in some degree, possesses the faculty of soaring, and, in the examination of the atmospheric conditions that make possible soaring flight, I have come to much the same conclusions as those reached by Dr. Hankin.

In the first place I find that air currents are not the direct cause of "soarability," and, in fact, tend to interfere with the buoyancy of the mass of air. Naturally a species of lift, or soaring effect, is produced by a head draft in the line of gliding flight when the gliding surface already possessed an impetus, but this relates to the force and angle of the air current impinging on the gliding surface, and in no way adequately accounts for the phenomenon of "soarability," although to the casual observer it may appear so to do.

The long-distance soaring flight of birds apparently takes place in the entire, or almost entire, absence of air-currents, and evidently has a direct relation to the sun's rays—and that not through any feeling of elation on the part of the bird through the sun's presence, as has been most ludicrously suggested. Nor does the interdisposition of clouds *necessarily* produce non-soarability, although the continued presence of heavy clouds tends in almost every case to reduce the buoyancy of the atmosphere, for the same reason that the air at night possesses under ordinary conditions less buoyancy than during the day. In both cases the sun's rays are intercepted, in one case more or less partially, and in the other more completely.

As I have been carrying out my experiments with a machine, I have had more opportunity of observing the atmospheric conditions that give "soarability" than is possible in the observation of the flight of birds, and there seems to be a factor in the case that Dr. Hankin and some other observers have overlooked, which is the presence of moisture or water vapour in the air. I have found that the maximum of soarability is reached with the sun in evidence and at its zenith and after light showers of rain. Soarability is also manifested in a marked degree on a bright and warm morning following a dewy night.

The poet has also observed that the birds soar away blithely in the morning and flap home wearily at night. The *Manchester Guardian* will no doubt argue that it is depression of spirit, due to the gathering gloom, that causes the home-going bird to exercise its weary self in flapping flight, but I think we will give the bird credit for more sense and less sentimentality.

The bird generally makes the best of atmospheric conditions in the endeavour to cover the greatest area of observation in its search for food, and when full up—unlike some human beings—gets home as quickly as possible at night.

There is some direct scientific relation between the soaring tendency of the morning bird and the flapping tendency of the evening bird, and all my observations trend towards the conclusion that these varying phenomena are due to the expansion and condensation of the moisture carried by the atmosphere and produced by the presence and relative absence of sun rays.

Now Dr. Hankin has concluded—and I think rightly—that a species of "explosion" takes place beneath the wing of the soaring bird, due to the disturbing of the atmosphere at its entering edge, and also possibly to the vibration of certain feathers in its under surface; but I further conclude that the "explosion" is that of the particles of water vapour that, when struck, change into more rarified gases, and may even be to some extent decomposed into their component parts of hydrogen and oxygen. Moreover, in all species of evaporation electricity is generated and this may also be a factor in the buoyancy of the air when evaporation is taking place, and may also have some relation to the volatilisation or decomposition of the moisture beneath the wing of the soaring bird.

The rapid evaporation, or expansion, that takes place when a boiling liquid is stirred, or when steam is beaten by a fan, is in a degree analagous to the result produced by the impact of the bird's wing against the rising particles of moisture in the air; and as a current of air may either chill or assist the expansion of steam, according to its temperature and rate of travel, so air currents are likely to adversely affect the soarability of the air, either by condensing the moisture in suspension in it or by effecting the explosion, or expansion, of the water particles in a manner similar to the action of the bird's wing.

Whether this force given to the water particles by the sun agrees with Dr. Hankin's conception of "ergaer" and whether this extended theory agrees with his observations I will leave for him to decide; however, my experiments, in a small way, with dry air tend to show that it is absolutely unsoarable.

C. WALPOLE DRURY.

[It is as well that our columns should afford an outlet for the free expression of opinion and thought, more particularly on a subject like flight, which admittedly is in a very undigested condition. But, we could wish to see more scientific criticism of Dr. Hankin's suggestion that "ergaer" is something other than the energy of air moving in mass, because we feel that it is much easier for Dr. Hankin to answer questions on matters relating to his observed facts than it is to deal seriously with vague speculation. Dr. Hankin alone knows precisely what he has seen, and not even the closest student of his articles can possibly have in mind the actual facts of the case so clearly as he. Moreover, Dr. Hankin was very careful to insist that he used the term "ergaer" as implying a subject *to be investigated* and it is certainly not the best way of getting at the root of the matter to accept the inference that "ergaer" is a new force before we have thoroughly satisfied ourselves that all the old theories are inadmissible.

Besides, it does not seem to have occurred to a number of our readers that the existence of a new force would complicate rather than simplify the problem, inasmuch as the bulk of the force manifested in the phenomenon of soaring is admittedly the result of a "mass-acceleration" reaction. For example, suppose the bird has a gliding angle of only one in five, then it will require a propulsive force equal to only one-fifth of its weight to maintain it in horizontal flight. The weight of the bird itself is supported by the dynamic upward reaction of the air mass in downward acceleration caused by the wings acting as cambered planes.

If a wind is blowing and the wind has an upward trend, coupled with a sufficient velocity to cause the vector representing the resultant pressure on the bird's wing to incline forward instead of backwards from the vertical, then there will be a component of pressure in the line of flight sufficient to balance head-resistance, and, therefore, to enable the bird to maintain its state of relative motion without loss of height, *i.e.*, to soar. It is, of course, immaterial whether the bird moves in relationship to the earth or not; if the wind conditions are suitable, soaring may manifest as hovering over a certain spot. If the wind is horizontal and pulsating, soaring is also possible under certain conditions; but if a horizontal wind does not pulsate, then soaring is impossible. Meteorologists have for a long time emphasized the fact that no natural wind is uniform either in direction or speed.

When we speak of wind, it is usually assumed that the motion the air is sensible to the human body, but Dr. Hankin's observations once more raise the question as to whether it is not possible to have vertical up-currents that are imperceptible to any ordinary observation, but are nevertheless sufficient to maintain soaring flight. We have already explained that very low velocities are sufficient to account for the phenomenon, as for instance, if a bird having a gliding angle of one in five is observed to have a soaring speed through the air of 30 ft. per second, then an up-current of 6 ft. per second would be sufficient to prevent the bird from losing altitude.

The new factor introduced by Dr. Hankin's research is the association of soarability with sunlight, coupled with the observation that the existence of visible heat eddies when sunlight is not present does not cause soaring to take place and in fact seems to be inadequate to create a "soarable" atmosphere. Dr. Hankin concluded from these observations, together with a variety of others that corroborated them in respect to the significance of sunlight, that there might be some cause at work other than the movement of air in mass due to the heating effect of the sun's rays.

Before accepting the necessity for an alternative solution, however, it is necessary that the established conception should die a harder death, and it is for those fully conversant with the structure of the atmosphere and the influence of the sun's rays on its movements to say how far the actual shining of the sun might cause the immediate strengthening of upward air currents as compared with those that could be maintained by the natural heat of the ground that is temporarily in shadow. Then again, if it is a case of heated air rising, there is the question as to the manner in which the colder air from the upper levels may be falling to take its place and why, if these contrary movements are existing in the same field, the upward energy in the one mass should be superior to the downward energy in the other. This aspect of the subject is one on which there ought to be, and probably is, some information within the possession of our readers—particularly those who are meteorologists—whose evidence might go a long way to settling the mystery of soaring in apparent calm.—ED.]

Otto Lilienthal.

[1512] I am writing to inform you of an incident which I believe is not generally known. Twenty-two years ago, at the firm of Messrs. Simpson, Strickland and Co., the well-known engineers and launch builders, there were employed two fitters named Lilienthal or Lewenthal, of German nationality. These brothers spent a great part of their spare time in building gliders. One of them, named Otto, essayed to glide across the Dart, but failed. Can it be that these were the famous Otto Lilienthal and his brother? A photo of a memorial medal appeared in FLIGHT some time ago, bearing the effigy of Otto Lilienthal. This I showed to two of our

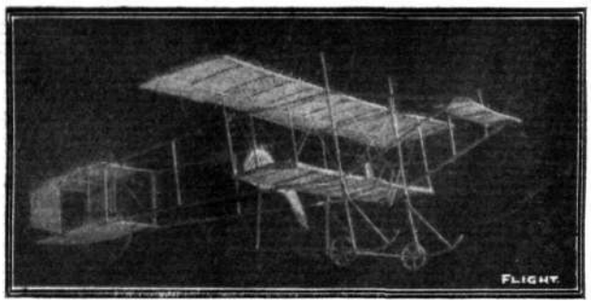
employees, who were contemporary with the two fitters already mentioned, and they asserted that it was the effigy of one of the two brothers. These facts seem to go to prove that my supposition was right, that is, that Otto Lilienthal was at some period of his life employed at Messrs. Simpson, Strickland's works. Another fact is that after these brothers left the firm, one of them was reported to have been killed while gliding. Now, Sir, I should be very glad if you or other readers could clear this matter up.

Dartmouth. W. H. M. HIGHAM.

MODELS.

[1513] I am sending you a photograph of a $\frac{1}{4}$th scale racing Farman which I have constructed. The framework throughout is of Spanish chestnut, and I advise any model maker who wants a tough pliable wood of medium weight to try it.

This wood behaves splendidly under the influence of steam, and he would be a clumsy workman indeed who split the wood in making an ordinary bend. In this model the longitudinal struts



connecting the elevator with the tail are in four pieces only—two to each side running the whole length of the machine. The ailerons and elevators are all worked from levers on the pilot's seat in front, and the whole thing differs only in size and a few very minor details from the real machine.

Chalford. A. D. LEGGE-WILKINSON.

⊛ ⊛ ⊛ ⊛

A Curtiss for the U.S. Army.

A CURTISS double-control biplane was despatched from the works at Hammond Port, N.Y., on February 29th to the winter headquarters of the U.S. Army Aviation School at Augusta, Ga. The machine has been built to the Army specification and in view of the Army officers' avowed preference of the Wright type of machine the demonstration flights will be watched with considerable interest.

Hydroplaning in Florida.

HYDRO-AEROPLANING has become quite popular with New York society visitors to Florida, and Mr. G. Witmer, in charge of the Curtiss School at Miami, Fla., is kept pretty busy taking passengers for oversea flights. On March 1st, he took Miss Anna Spillman to Cape Florida, a distance of little over twelve miles, turning above the Florida Cape Light at a height of about 1,200 ft. Coming back the aeroplane was over the sea the whole way, being kept about three miles off the shore. The round trip of 25 miles was covered in twenty-four minutes.

Landing in the Street.

SOMETHING of a sensation was caused in San Francisco on February 16th when Horace Kearny brought his machine down in one of the city streets and delivered a message which he had brought to the Mayor from the Mayor of Oakland where an Aviation Meeting was to open on the following day. The aviator had to pick his way through overhead wires which crossed the street at 300 foot intervals, his landing place being indicated to him by Lincoln Beachy and Parmelee. He covered the distance of eight miles in seven minutes while the return journey took six minutes.

£5,000 Prize for a Turbine Motor.

IT is announced from New York that the Standard Oil Company is planning to offer a prize of £5,000 to the inventor who produces a practical oil-consuming turbine motor. In addition, the Standard Oil people propose to assist the inventor in properly financing his enterprise and in marketing the motor.

Miss Quimby Coming to Europe.

WE learn from New York that Miss Harriet Quimby, who has now left the Moisant Company, will shortly be paying a visit to Europe, and hopes to take part in some competitions against the French aviatresses. She will also seek a fast monoplane to take back and use at the Chicago Meet next summer.

Airships and Aeroplanes at French Review.

WHILE the annual spring review of the Paris garrison was in progress at Vincennes on Sunday last, two dirigibles and a number of aeroplanes made their appearance over the ground. The airships were the "Capitaine Ferber" and the "Adjudant Reau," while the aeroplanes included Maurice Farman biplanes piloted by Lieuts. Cayla, Cheutin, Leclerc and Coville, as well as Henry Farman biplanes piloted by Lieut. Pierra and Sapper Seguin.

Large Parties on the "Adjudant Reau."

WITH a party of 13 on board, the Astra dirigible, "Adjudant Reau," made a long cruise recently to the west of Paris, while in the afternoon of the same day it was in the air for 2 hrs. in the neighbourhood of Versailles with a party of 17 officers on board. Each time it was under the command of Capt. Renaux, assisted by Lieut. Caussin.

⊛ ⊛ ⊛ ⊛

IMPORTS AND EXPORTS, 1911-12.

AEROPLANES, airships, balloons and parts thereof (not shown separately before 1910):—

	Imports.		Exports.		Re-Exportation.	
	1911.	1912.	1911.	1912.	1911.	1912.
	£	£	£	£	£	£
January ...	1,196	619	1,088	2,412	Nil	Nil
February	3,129	3,110	1,786	36	Nil	Nil
	4,325	3,729	2,874	2,448	—	—

⊛ ⊛ ⊛ ⊛

PUBLICATIONS RECEIVED.

How to Play the "Naval War Game." By Fred. T. Jane. London: Sampson, Low, Marston, and Co., Ltd. Price 7*s.* 6*d.*

Catalogue.

Curtiss Aeroplanes. The Curtiss Aeroplane Co., Hammondsport, N.Y., U.S.A.

⊛ ⊛ ⊛ ⊛

Aeronautical Patents Published.

Applied for in 1911.

Published March 14th, 1912.

6,635. H. A. A. J. LELARGE. Aeroplane with automatic stability.
6,982. R. BOZON. Balancing and steering aeroplanes.
25,856. V. H. MAMMATT. Automatic control for flying machines, dirigible balloons, &c.

PRINCIPAL CONTENTS.

FLIGHT.

44, ST. MARTIN'S LANE, LONDON, W.C.
Telegraphic address: Truditur, London. Telephone: 1828 Gerrard.

SUBSCRIPTION RATES.

FLIGHT *will be forwarded, post free, to any part of the world at the following rates:—*

UNITED KINGDOM.	*s.*	*d.*	ABROAD.	*s.*	*d.*
3 Months, Post Free ...	1	8	3 Months, Post Free ...	2	9
6 ,, ,, ...	3	3	6 ,, ,, ...	5	6
12 ,, ,, ...	6	6	12 ,, ,, ...	11	0

Cheques and Post Office Orders should be made payable to the Proprietors of FLIGHT, 44, St. Martin's Lane, W.C., *and crossed London County and Westminster Bank, otherwise no responsibility will be accepted.*